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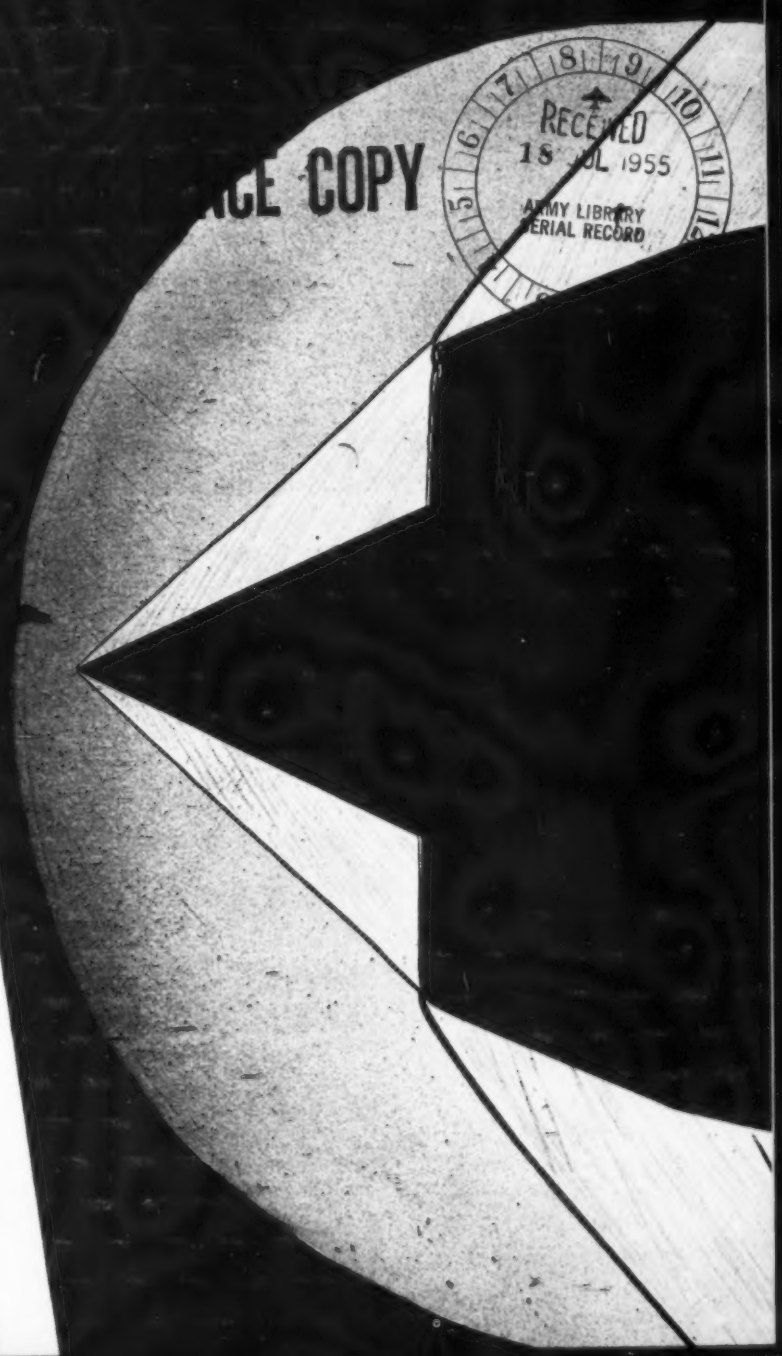

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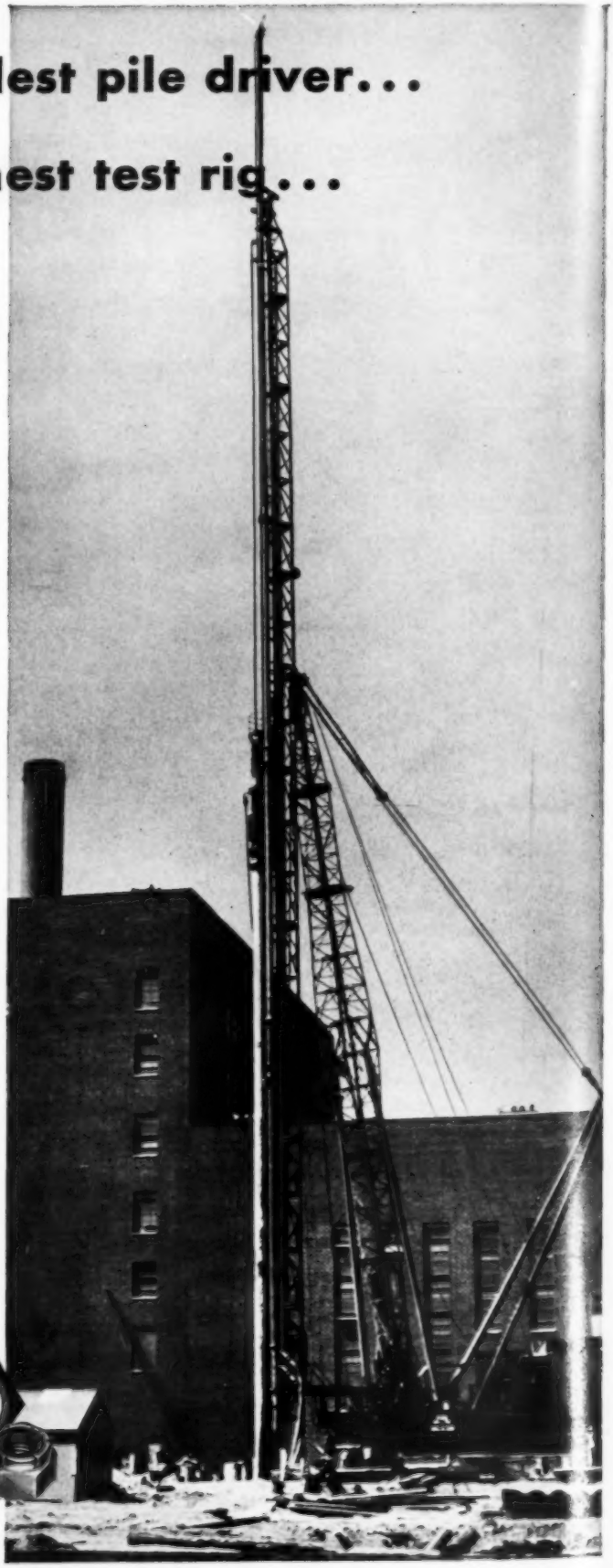

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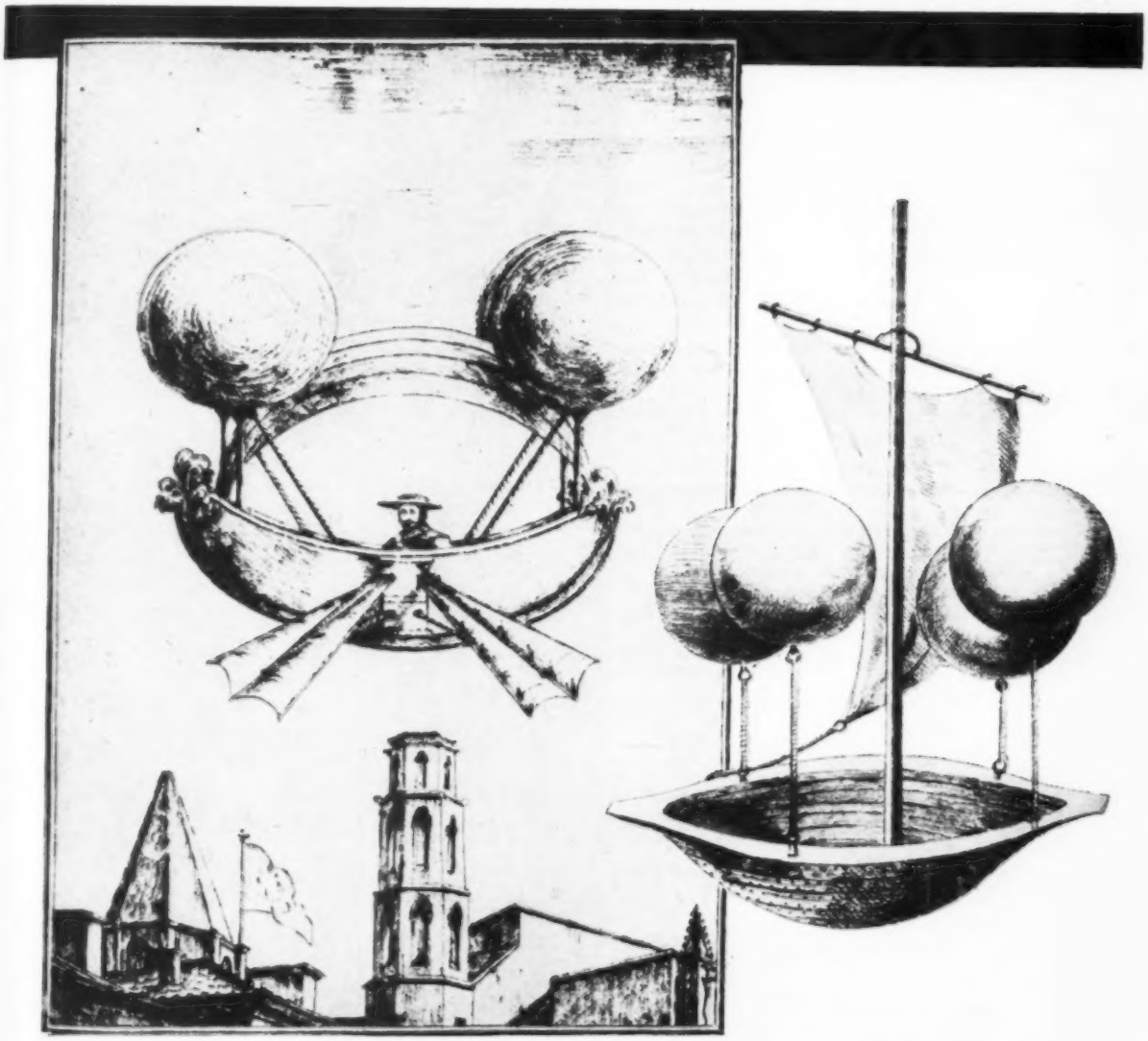
MAN'S CONQUEST OF THE AIR

Lana's Flying Boat



Of the many ways by which men have tried to fly, here is one of the strangest. It involved pumping all the air out of four copper globes attached to a boat-like car. This aerial chariot was designed by Francisco Lana in Italy about 1670.

What Lana didn't know was the actual pressure and density of air, or he might have seen his error. Both of these were determined two years later. Even so, the idea still attracted attention nearly 200 years afterwards. In fact, a Frenchman, Marey Monge, actually built a machine from Lana's plans and tried vainly to fly it in 1843.

We may smile at Lana's flying boat now, but it was out of such trial and error that man finally flew. Today ESSO research, which has played an important part in the development of superior aviation petroleum products since the start of powered flight, is continuing to seek new and better ways to help men fly.

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July 18, 1955 - VOL. 19, No. 4

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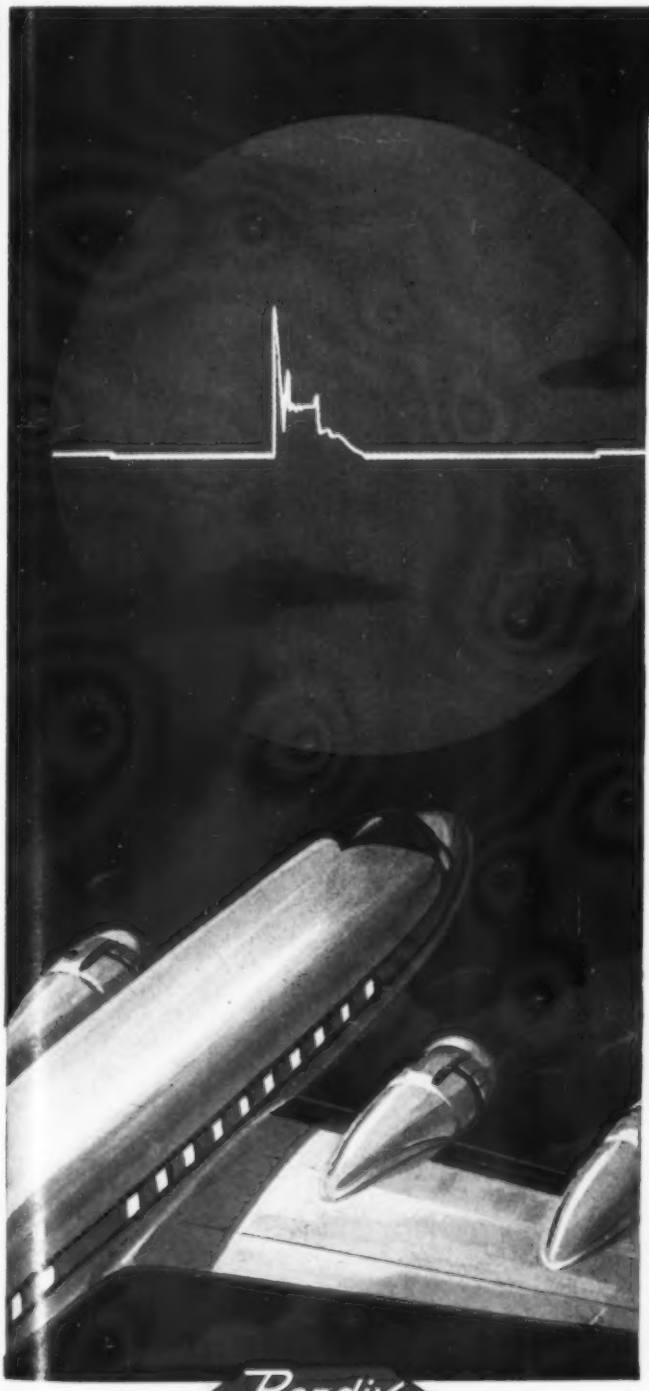
The Most Trusted Name in Ignition



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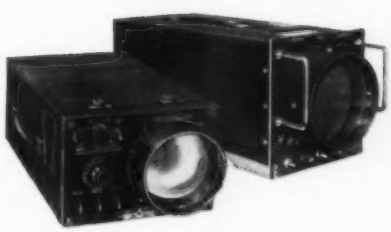

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Industry News Digest

Administration Softens Opposition To Monroney Airport Aid Bill

The Administration has modified its opposition to the $252 million contract authorization bill for federal aid to airports. Appearing before a House Commerce subcommittee, Under Secretary of Commerce Louis S. Rothschild testified that the Department of Commerce will support the contract authorization principle if other aspects of the measure carried some major amendents.

Rothschild asked that the House version of the Monroney bill (See story page 27):

• **Reduce the proposed** four-year duration of the contract authority to two years, because, according to Rothschild, "it is most unlikely that firm programs for federal-aid would be prepared more than two years in advance."

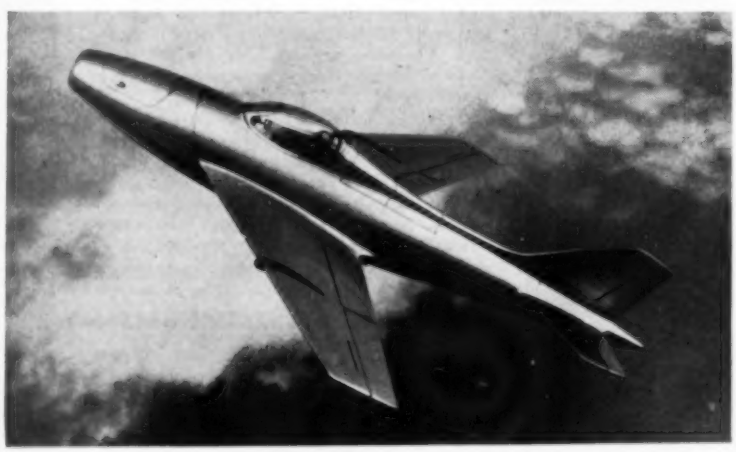
• **Reduce the annual authorization** from $63 million to $42 million. "We believe," the Under Secretary said, "that there has been a tendency to attach undue weight to . . . several sets of data, as justifying the proposed level of contract authority contained in this bill." He noted that the joint AAAE-AOC-NASAO survey and other reports submitted to Congress had "no screening whatever in terms of national interest or federal responsibility."

In asking for the appropriation reduction, he urged that the $20 million in federal aid already passed by both Houses be considered part of the first year's authorization. The Senate version considered the $20 million an additional sum to its $63 million authorization, providing $83 million for fiscal '56.

Rothschild asked further that the House scrap the requirement that the National Airport Plan include all types of airport development eligible for aid. He labeled this section as "unnecessary and undesirable" and warned that it "would be a serious mistake" to revert to the original concept of the plan.

"We strongly urge the Committee not to take favorable action on a provision which would cast doubt on the Department's ability to establish any general and objective criteria in the future," Rothschild concluded. "It is our sincere belief that such a provision would handicap efforts to assure that the investment of public funds is concentrated upon essential projects."

The recommendations of the Commission on Intergovernmental Relations, released just before the House hearings began, are credited largely with the change of Administration position, it is understood.



U. S. Orders Italian Lightfighters

U.S. sponsorship has been given to a derivative of the Aerfer Sagittario 2 lightweight fighter (illustrated above), a prototype of which is now under construction at the company's plant in Pomigliano, near Naples. The U.S. has placed a $2.3-million contract for three prototypes of this Italian aircraft, named the Ariete, and plans to order seven pre-production models. The Ariete notably differs from the Sagittario 2 in having a modified rear fuselage to house a Rolls-Royce Soar in addition to the main powerplant, a Rolls-Royce Derwent.

Reports from Europe indicate that new, more powerful versions of both the Derwent and the Soar will be fitted in the Ariete, giving about 5,000 and 2,000 lbs. thrust, respectively. The Derwent will be used in combination with the Soar for take-off and combat but for normal cruising only the Soar will be used.

Navy Eases Missile Display Restriction

Navy Department's ban on public display of guided missiles has been relaxed. A new order now permits public showing of such missile types as the Loon, Lark and Gorgon, the Regulus, and dummies of the Sparrow and Terrier.

Navy Secretary Charles S. Thomas indicates, however, that the rule prohibiting exhibits of new weapons and experimental planes remains in effect. Such showings must have specific approval of Navy headquarters in Washington.

U. S. And Germany Sign Disputed Pact

Controversial bilateral air transport agreement between the U.S. and Germany (American Aviation, July 4) was signed in Washington on July 7. Its terms were identical to those agreed upon during June negotiations, which later brought "giveaway" charges from opposing U.S. carriers.

Signing the document were Under Secretary of State Herbert Hoover, Jr. and German Charge d'Affaires ad interim Albrecht von Kessel. It provides for operation of German-designated airlines over these routes:

• Germany to Boston, New York and Philadelphia and beyond to points in the Caribbean and beyond to South America.

• Germany to Chicago.

• Germany to San Francisco or Los Angeles.

The U.S., in return, receives authorization to serve five German cities (Frankfurt, Dusseldorf - Cologne - Bonn, Hamburg, Stuttgart and Munich) and rights beyond Germany.

Pentagon Studies Hoover Reports

Defense Secretary Charles E. Wilson has named Charles A. Coolidge to the post of Special Asst. to the Secretary of Defense to analyze Hoover Commission reports which apply to the Defense Department.

Coolidge, who served as Asst. De-

fense Secretary from November 1951 to December 1952, will review the Hoover group's findings to determine to what extent they should be put into effect, and recommend to Wilson the best method of adoption.

Piasecki Forms New Aircraft Company

Frank N. Piasecki, who in May was displaced as board chairman of Piasecki Helicopter Corp., has formed a new company called Piasecki Aircraft Corp. Firm was chartered on June 21 with $300,000 capitalization.

Purpose of the new organization, the charter states, is to furnish and supply engineering research, planning and development service of all kinds.

The step by Piasecki confirms reports of a continually widening breach between the management of Piasecki Helicopter Corp. and its founder since his loss of the board chairmanship.

PHC officials indicated the directors have been meeting regularly with Piasecki since that time to convince him to remain with the company as a director and in a top engineering post.

The new firm, however, may be in line for contract work from the helicopter corporation. PHC directors are reported to have discussed such a deal with Piasecki, but indicated at press-time that no specific arrangement could be agreed upon.

TCA Viscounts Spur New Traffic Gains

Trans Canada Airlines, which has now taken delivery of 10 of its 25 Vickers Viscount transports, continues to register new traffic gains with the turboprops.

In New York-Toronto service, TCA reports a 32.6% increase in passengers carried for the first three months of Viscount operation compared with the same period last year. With Viscounts the airline carried 30,378 passengers between April 1 and June 30 against only 22,907 last year.

Passenger load factors show a decided increase on all Viscount routes, TCA says. From April to June, the turboprop operation has produced an 81.5% load factor compared with 72.6% for all TCA flights with all types of equipment.

Republic Denies XF-103 1st Flight

Republic Aviation Corp. officials have categorically denied a foreign press report that its XF-103 supersonic Air Force fighter has flown. They declined to comment further, however, on a description of the fighter appearing in the French aviation journal, *Les Ailes*.

The French article said the XF-103 is powered by a Wright J67 for subsonic flight and uses a ramjet for speeds over Mach 1. Both engines were described as using the same airstream, with the pilot directing the flow from one engine to the other by vanes.

Pilot of the fighter, it said, is completely enclosed in the aircraft and is unable to see outside except by periscope.

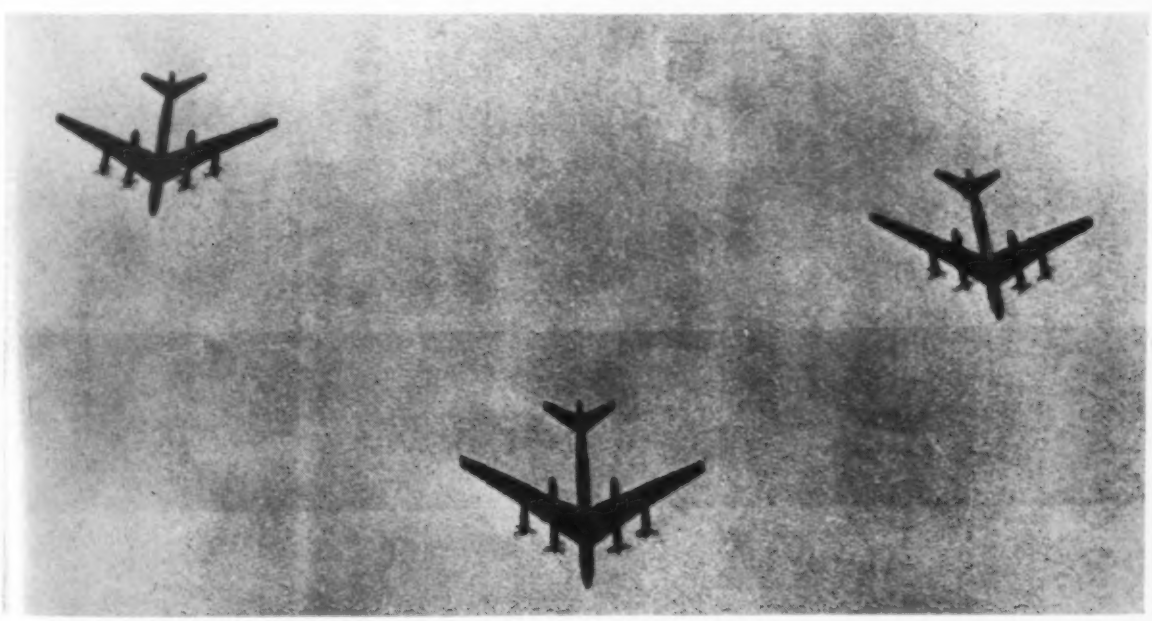
North Central Sues Former Director

North Central Airlines has filed a $107,483 damage suit against its former director and executive committee member R. B. Stewart for allegedly not acting in the best interests of the airline.

The suit alleges that Stewart "interfered" with NOR's opportunity and contractual rights to acquire stock of Lake Central Airlines by seeking out, encouraging and assisting other potential purchasers of LCA stock.

The airline charges further that Stewart failed to give a full and adequate presentation to the Civil Aeronautics Board on behalf of NOR and, as a result, the airlines sustained a $70,470 loss in air mail revenue.

Stewart was dropped as a NOR director last winter when the airline refinanced its Purdue Research Foundation loan.



BOMBER OR TANKER? Newest of Russian aircraft developments unveiled during Soviet air show July 3 is four-engine turboprop bomber or aerial refueler shown here in Associated Press wirephoto. Reds displayed seven of the turboprops along with a first showing of 50 new twin-jet all-weather fighters and 47 single-engine supersonic fighters. All are believed to be in mass production.

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Personal View

By WAYNE W. PARRISH

Pentagon Brownout

FEW BUNGLES in government in the past few years match the brownout of vital information by the Pentagon. We concur with the howls raised by the aviation and national press that the criterion most recently established for the determination of security classifications is pure nonsense.

It is only a matter of time until R. Karl Honoman, who dreamed up the measurement that only "useful" information should be allowed to see the light of day, retires somewhat ungracefully from his present post as deputy assistant secretary for public affairs. Our best guess is that he will depart Washington no later than September. Thus the cycle of transitory public relations leadership takes another turn.

The Pentagon hasn't had a sane and sensible public information policy for some time and we think the blame rests with the top civilian command. Along with so many others we long for the masterful skill of Major General Sory Smith who headed up USAF public information for a long and fruitful time.

Secretary of Defense Charles E. Wilson, no matter what his many capabilities may be, is no pacesetter for good public information policies. At the heart of the trouble is the civilian superstructure of the Department of Defense which has been erected on top of the structures of the three services. By and large, civilians have been poor judges of security matters. Granted that service officers occasionally pulled real "bloopers," their over-all performance has been superior.

Far too much vital information is being covered up. Senator Stuart Symington, who himself is a former Secretary of the Air Force, is undoubtedly correct in lambasting the extreme censorship now in force. If there is any information and data now hidden under security wraps which is not already known to other countries, we are unaware of what it could be. It's time a little realism was injected into public information policies and maybe with the coming departure of Mr. Honoman the wheel will take a turn for the good.

Talbott and Lewis

SEVERAL IMPORTANT changes in Air Force civilian leadership will take place between now and the remainder of the year. Secretary Harold Talbott is now expected to leave because of health reasons, and Assistant Secretary Roger Lewis will leave probably about October 1 on his own volition after putting in two and a half years at one of the toughest assignments in Washington.

No one ever entered into a government post with more energy, enthusiasm and zeal than Mr. Talbott. It has been a crowning experience to an active life and even his detractors will admit that he pitched in with vigor to get things done and in particular to raise the morale of the men in uniform. He has given unstintingly of his time and effort. But reports indicate that he's been ordered to slow down and take it easy. The Washington grind is a wearing one even on the best physique.

The aircraft industry concedes that Harold Talbott has made many contributions. Yet there's no denying the fact that industry will be relieved when he takes his bow. So, too, will be many of the top USAF command.

The reason is not hard to find. Mr. Talbott of late has been delving much too deeply into purely operational matters, calling the shots on details, and making too many one-man hard-driving decisions. In short, he's been getting in everybody's hair. There are times when a single driving force is needed to jolt a vast organizational structure into action. But there comes a time when such vertical maneuverings result in crossed wires and confusion. USAF is too big for one man to call all the shots. A Secretary is supposed to set broad policy and administer.

For Roger Lewis, the story is different. He accepted the appointment in the spirit of public service. After two and a half years he feels it is time to return to private industry. In government one reaps headaches and criticism and relatively few thanks, although Mr. Lewis must know that he is highly respected and highly regarded. As secretary in charge of procurement he has been unable to make everybody happy, but there is no one in industry from coast to coast who has ever questioned Lewis' integrity. As the first man with industry experience to hold down the tough procurement most, Lewis has acquitted himself well. His spot will be difficult to fill.

Rizley of CAB

WE'VE BEEN ASKED many times recently how the new CAB Chairman, Ross Rizley, is doing. The answer is brief. We think he's doing fine. Speeding up and reorganizing any government agency takes time. Mr. Rizley has made no spectacular advances, but bit by bit, and quietly, the results are beginning to show up for the better. He's a tough, smart administrator. He was a good choice for the chairmanship.

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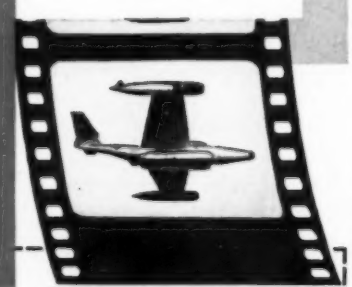

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Letters

Voice from Belgium

To the Editor:

Let me first introduce myself to you. I am in charge of the planning of civil radio navigation aids in Belgium and have been in the business for almost 25 years. I have attended all ICAO Communications meetings since 1945 and have been chairman of the 4th and 5th sessions of its Communications Division as well as of the Communications Committees of several regional meetings.

I have very good and frequent relations with numerous governments and industry radio and aviation specialists in almost all western countries. I have been attending, nationally and internationally, quite a number of joined military/civil meetings concerned with radionavigation and the use of air space.

All the preceding is not to take any pride of my position, but to show that I have some good reasons to believe that my personal opinion on the VOR/TACAN controversy may present some interest to your readers. Nevertheless, I freely admit that, as far as the battle remains restricted to the limits of the U. S. territories, this opinion must appear as impertinent.

But the fight has already reached other ICAO countries, and this induces me to air my views which, obviously, are purely personal and should not be considered as expressing the opinion of any organization for which I work or may have worked.

Now, this opinion is a very short one, much shorter than the introduction to it, and it results from the fact that, when military and civil have agreed on a common system, this system ceases to be secret.

It takes no time for the military to recognize that fact, and they immediately do have a requirement for another system which cannot be used or jammed for some time by a potential enemy. As research on the new system starts several years later than on the "last common system," all technical progress made in the meantime is available and it becomes highly probable that the new secret military system will have some advantages over its older brother.

When the secret starts leaking concerning a better system than the present common system—just implemented, and for which all necessary investments have been spent—then a campaign begins in favor of "commonizing" this new, better and still unknown system.

And the proposal is made in government circles to replace that old common TACAN by a much better common XXX system.

Which will cease to be secret and be followed, after some years, by a new common YYY system.

This is what scientists call a recurrent phenomenon.

R. LECOMTE,
Civil Engineer, Inspector General, Airports and Airways Administration, Belgium
Brussels, Belgium

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OF THE COMPANY WE KEEP!"

ROSÁN ring-locked threaded fasteners perform an important part in the success of Convair's F-102A supersonic interceptor. When planes fly higher and faster Rosán fasteners will help them do so **SAFELY!** Millions used since 1942 **without failure!**

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Unsurpassed anywhere for its superior locking action. Many sizes and styles for your every fastening need.

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Production Spotlight

• Small batch of Ryan Navion L-17s will be modified as target drones. Work will be handled by Temco under an Army Signal Corps contract.

• First Fairchild C-123B has gone into USAF service at Ardmore AFB, Okla. Plane has been in production for almost a year but previous deliveries were assigned to various USAF testing centers.

• North American Aviation now holds a production order for the F-107, an advanced version of the F-100 Super Sabre.

• USAF still remains unmoved about giving Boeing the go-ahead to build a commercial transport version of the KC-135 jet tanker. Although Douglas is starting to book orders for the DC-8, AF says its policy (not authorizing commercial output until satisfied its needs will be met) has not changed.

• Boeing still is looking around for an inland site to produce the IM-99 Bomarc interceptor missile. AF has told Boeing unequivocally that IM-99 production will not be permitted in the Seattle area.

• British Overseas Airways Corp.'s Bristol Britannia 300LR, with a still-air range of 5,350 miles, will be able to carry its capacity payload of 93 passengers westbound from London to New York nonstop against a 90 mph headwind.

• Rolls-Royce is bench-running a 15,000-lb-thrust turbojet, as well as the 14,500-lb.-thrust Conway bypass engine.

• Westinghouse is interested in license-building the Rolls-Royce RB-106, a new high thrust turbojet.

• The Bristol Olympus BOL-6 is giving 16,000 lbs. thrust on the bench.

• License-built commercial Sikorsky S-55s sold by Westland Aircraft, Ltd., now total 19. About double this number has been ordered for RAF and Royal Navy use.

• Bristol Aeroplane Co., Ltd. has started ground runs with its Type 191 helicopter prototype, a Type 173 airframe with Alvis Leonides Major "slave" engines. Leonides Major flight engines have been delivered for installation after preliminary ground runs.

• De Havilland has received an order for Vampire Trainers from Indonesia, nineteenth country to adopt the type.

• Douglas Aircraft Co. has a design for a "Super DC-6" having a shorter range and lower payload than the standard model. It will carry 64 passengers, cruise at 330 mph at 15,000 ft.

• Piasecki YH-16 entered Phase 2 flight-test stage early this month. Turbine-powered YH-16A has completed ground tests and probably will fly late in July or early August following completion of USAF inspection.

FUJI LM-1, four-place liaison plane, is the Japanese modified version of the Beech Mentor trainer which Fuji Heavy Industries, Ltd., formerly Nakajima Aircraft Co., is now building under license. It made its first flight June 6. It is expected that some 40 LM-1s will be ordered for the Japanese security forces under the fiscal 1955 defense program.

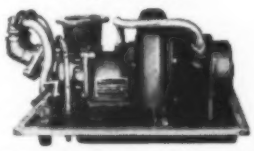
VICKERS "Instant Response"* HYDRAULIC MOTOR ... THE AIRCRAFT HANDY MAN

*Called "Instant Response" because it starts, stops or reverses almost instantaneously.

Vickers Constant Displacement Piston Type Hydraulic Motors are available in 24 sizes for 3000 psi.

Here Are a Few of the Jobs It Is Doing:

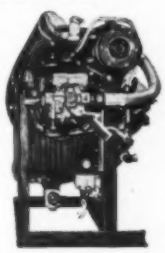
AERIAL REFUELING PUMP DRIVE



Fuel Transfer Pump built by Nash Engineering Co. for Boeing KC-97 Tanker. Powered by Vickers "Instant Response"* Hydraulic Motor.

CABIN SUPERCHARGING

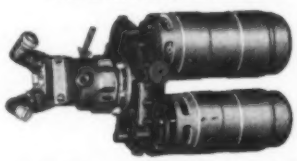
Douglas DC-7 Cabin Supercharger is driven by Vickers "Instant response"* Hydraulic Motor.



HORIZONTAL STABILIZER ACTUATOR

Built for Grumman F9F6 by Cleveland Pneumatic Tool Co. Powered by Vickers "Instant Response"* Hydraulic Motor.

ALTERNATOR GENERATOR DRIVE



Alternator Generator Drive for Convair T-29 uses Vickers "Instant Response"* Hydraulic Motor.

TELESCOPING BOOM ACTUATOR

Built by Jack & Heintz to extend and retract boom for in-flight refueling. Driven by a Vickers "Instant Response"* Hydraulic Motor.

AIR COMPRESSOR DRIVE

Built by Walter Kidde & Company, Inc. and driven by Vickers "Instant Response"* Hydraulic Motor.

What Can It Do for You?

These light-weight, compact, highly efficient hydraulic motors provide high power in a very small package. Their overall efficiency exceeds 92% . . . their volumetric efficiency exceeds 96%.

Operating characteristics are remarkable. These motors will stop from maximum speed in from .116 to .167 of a revolution . . . will accelerate from standstill to maximum speed in from .00019 to .0051 sec (depending on size). They can be stalled indefinitely without damage.

Vickers Hydraulic Motors have many uses on aircraft . . . just a few of them are shown above. Wherever you need high torque, high efficiency and high horsepower-weight ratio . . . or where instantaneous and positive control are required, these motors are your best choice. Write for Bulletin A-5205.

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ENGINEERS AND BUILDERS OF OIL HYDRAULIC EQUIPMENT SINCE 1921

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Those three mice

...wouldn't get to first base

Don't blindfold yourself to your own future. Know where you want to go, and you'll see how much better the opportunities are at Fairchild.

Engineers with an eye on their futures are looking to Fairchild for careers that lead to the top, because they know at Fairchild they'll work in the country's most advanced and active research centers. They'll be in right from the beginning on everything new that's happening in aviation.

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Put yourself in a position with a future – at Fairchild. Send your resume today to Walter Tydon, Chief Engineer.

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FAIRCHILD

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When & Where

Aug. 5-7—Third annual "Fly-In," Experimental Aircraft Association, Curtiss-Wright Airport, Milwaukee.

Aug. 8-10—Second National Turbine-Powered Air Transportation Meeting (sponsored by the Institute of the Aeronautical Sciences, Seattle.

Aug. 10-14—Air Force Assn. Convention and Airpower Panorama, San Francisco.

Aug. 15-20—National Flying Farmers' Assn. convention, East Lansing, Mich.

Aug. 19-21—Second annual "Fly-In," Antique Airplane Assn., Ottumwa, Ia.

Aug. 22-23—Symposium on Electronics & Automatic Production. Stanford Research Inst., San Francisco.

Aug. 24-26—1955 Ignition Conference sponsored by Scintilla Div., Bendix Aviation Corp., Sidney, N. Y.

Aug. 24-26—Western Electronic Show and Convention, sponsored by West Coast Electronic Manufacturer's Association and IRE, San Francisco.

Aug. 25—Annual corporate meeting, West Coast Electronic Manufacturers Assn., San Francisco.

Sept. 3-5—National Aircraft Show, sponsored by Air Foundations, Philadelphia International Airport.

Sept. 8—Airwork engine forum, sponsored by Pratt & Whitney and Bendix, Millville, N. J.

Sept. 15—Airwork engine forum, sponsored by Pratt & Whitney and Bendix, Miami, Fla.

Sept. 25-27—International Northwest Aviation Council's 19th annual conference, Yakima, Wash.

Sept. 26-27—Automation Symposium, sponsored by Radio-Electronics-Television-Manufacturer's Assoc., University of Pennsylvania, Philadelphia.

Oct. 3-5—National Electronics Conference, Sherman Hotel, Chicago.

Oct. 4-6—11th Annual Spark Plug & Ignition Conference, sponsored by Champion Spark Plug Co., Toledo.

Oct. 5-7—National Airports Conference (sponsored by American Association of Airport Executives and the University of Oklahoma with CAA cooperation), Norman, Okla.

Oct. 5-7—National Business Aircraft Association annual meeting and forum, Sheraton-Cadillac Hotel, Detroit.

Oct. 7—Aero-Medical Engineering Association symposium on "Escape from High Performance Aircraft," IAS Building, Los Angeles.

Oct. 11-13—Air Transportation Association engineering and maintenance conference, Dallas.

Oct. 11-15—Nat'l Assn. of State Aviation Officials annual meeting, Dallas.

Oct. 11-15—Society of Automotive Engineers aeronautic meeting, aircraft production forum and engineers forum, Los Angeles.

Oct. 31-Nov. 1—East Coast Conference on Aeronautical and Navigational Electronics, sponsored by I.R.E., Baltimore, Md.

Nov. 7-9—Eastern Joint Computer Conference (IRE-AIEE-ACM), Hotel Statler, Boston.

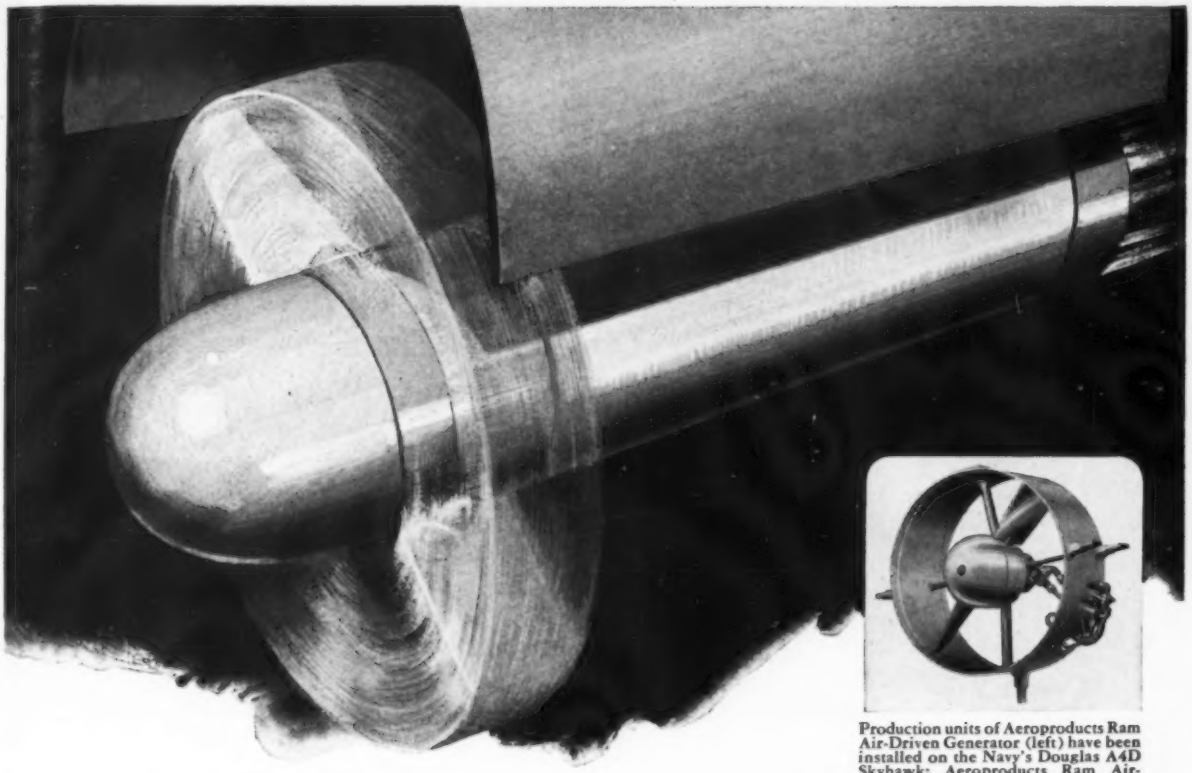
INTERNATIONAL

July 27-29—Helicopter Congress, Rotterdam Helicopter Syndicate, Rotterdam.

Aug. 30—International Civil Aviation Organization air navigation conference, Montreal.

Sept. 6—International Civil Aviation Organization conference on draft protocol to amend Warsaw convention, The Hague.

Sept. 6-11—Society of British Aircraft Constructors Aircraft Show & Flying Display, Farnborough, England.



Production units of Aeroproducts Ram Air-Driven Generator (left) have been installed on the Navy's Douglas A4D Skyhawk; Aeroproducts Ram Air-Driven Hydraulic Pump (above) is scheduled for installation on jet fighters.

Emergency Power in Seconds--

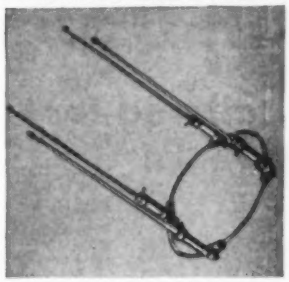
Electric or Hydraulic!

AEROPRODUCTS AIR-DRIVEN GENERATORS AND AIR-DRIVEN HYDRAULIC PUMPS GIVE POWER INSTANTLY TO FLY AND LAND A PLANE SAFELY

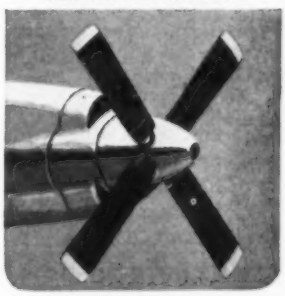
Aeroproducts has the answer to your requirements for emergency sources of electric and hydraulic power—ram air-driven emergency generators and hydraulic pumps.

In less than two seconds, Aeroproducts ram air-driven generators develop sufficient power to operate flight control surfaces and cockpit instruments necessary to fly and land a plane safely. Also, within this time, Aeroproducts ram air-driven pumps produce sufficient hydraulic pressure for the flight controls.

Aeroproducts also is ready *now* to meet your most demanding specifications for turbopropellers, propellers requiring high horsepower absorption, actuators, and other aircraft components now under development. Call or write us for details.



Actuators for Afterburners



Turboprop

General Motors engineering leads the way

GM GENERAL MOTORS

Building for today...Designing for tomorrow

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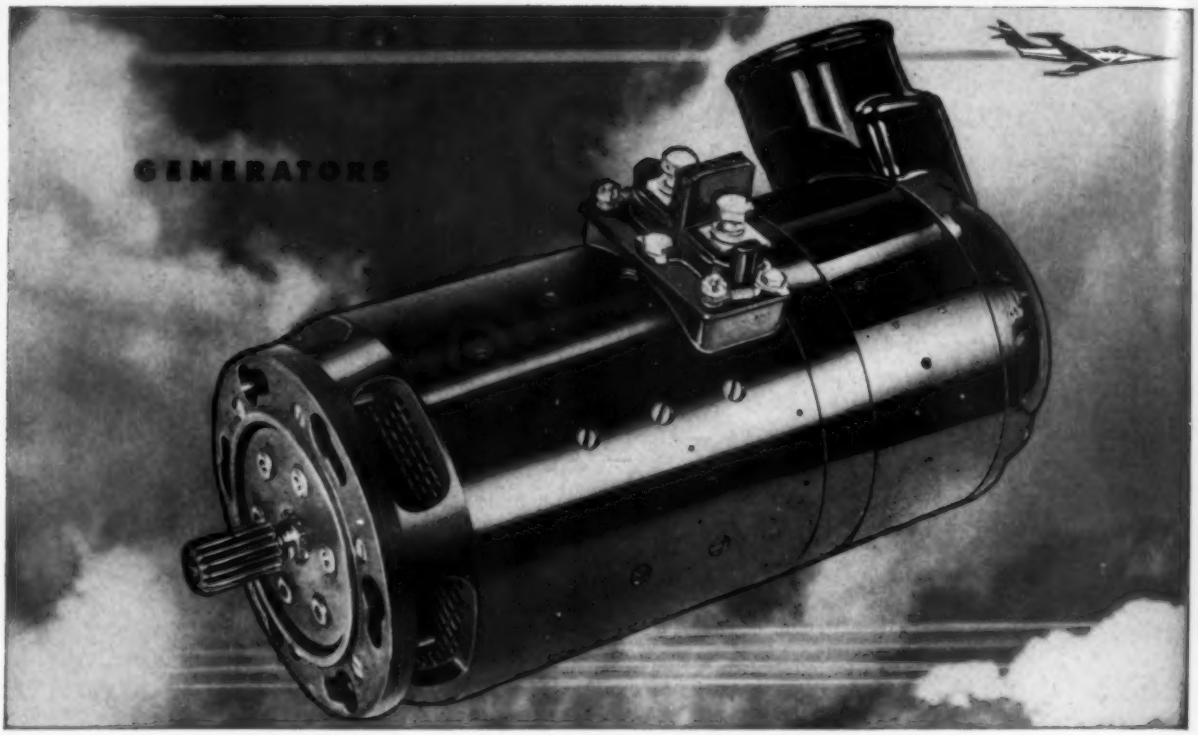

J&H D-C SYSTEMS—THE CHOICE

. . . tailored for ultra-high altitude, ultra-high-speed service

New model Jack & Heintz d-c generators and control panels, capable of satisfying the most severe operational demands, are scheduled for use on two of the latest models of military aircraft . . . complete d-c systems or individual components can be custom built by Jack & Heintz to meet your specific requirements.

GENERATORS . . . The Jack & Heintz line of d-c generators now includes a series of high-performance machines featuring continuous rated load at 8000 rpm. One model has proved performance at 70,000 feet. The generators in this new series which conform to MIL-G-6162 have an unusually efficient *straight-through* air path design for maximum cooling . . . high-temperature insulating materials . . . adjustable blast caps . . . and many other provisions that assure superior service.

CONTROL PANELS . . . Thirty-volt d-c generators with capacities as high as 500 amperes can be controlled and protected by J&H control panels operating with associated equipment. The panels meet all applicable military specifications or can be tailored to special requirements.

Built for long trouble-free service, these lightweight control panels feature simplified installation . . . tray or direct mounted.

J&H panels may include any or all of the following functions (which can be supplied as individual components, if desired): remote or manual trip-free resetting, voltage regulator, differential voltage and reverse-current relay, over-voltage relay, ground-fault relay, field relay, tickler resistor, field relay reset, field relay interlock, blocking rectifier, reverse-current coil and voltmeter test jacks.

JACK & HEINTZ *Rotomotive*

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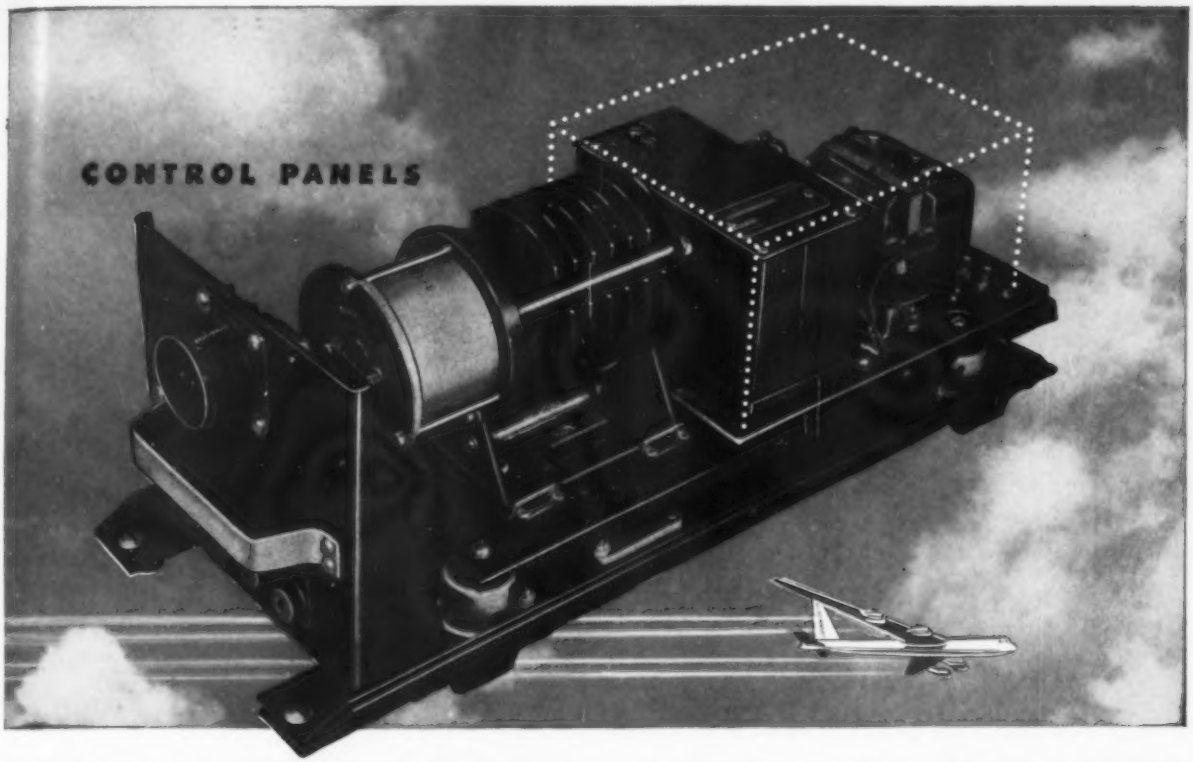

FOR ADVANCED JET AIRCRAFT

Subordinate, but important, components of J&H systems include:

FAULT-SENSING TRANSFORMERS AND SHUNTS

The lightweight J&H current transformers provide simple, trouble-free, generator and feeder fault protection with these major advantages:

1. No steady state power losses.
2. No voltage drops in the feeder cables.
3. No breaks in the feeder cables for coupling.
4. Resistance of cables between sensing elements not critical.

J&H electric shunts provide both metering and feeder fault-sensing voltages for generator control systems. Engineered for maximum performance, minimum space and weight, they can withstand 200% overload for a full minute without damage. All electrical contact surfaces are silver plated; resistance is constant within 2% of rated value in any still air ambient from −55° to +95°C.

COMPLETE FACILITIES

J&H has complete facilities for design, development and testing of your special aircraft accessories or systems . . . production for limited or full-scale runs. We invite your inquiry. Write Jack & Heintz, Inc., 17633 Broadway, Cleveland 1, Ohio. Export Dept: 13 E. 40th St., New York 16, N. Y.

OPPORTUNITIES FOR ENGINEERS

There's a promising future for electrical and mechanical engineers at Jack & Heintz. Engineering and research laboratories located in suburban Cleveland close to good residential areas. Many benefits include: insurance, hospitalization, medical care and liberal vacation policy. Write Manager of Technical and Professional Placement, today, for illustrated, descriptive booklet.

Military specification numbers as used herein are for purposes of product identification only and do not necessarily imply specification conformity.

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AIRCRAFT EQUIPMENT

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FUNDAMENTAL DIFFERENCES BETWEEN present management of Piasecki Helicopter Corp. and its founder, Frank Piasecki, apparently remain unsolved. As a result, pending arrangement for contract engineering by newly formed Piasecki Aircraft Corp. for the helicopter firm (See story P. 7) now appears doubtful. Following recent PHC board meeting, Piasecki said the restrictions which would have been placed on his new company were so great that its growth would have been hampered.

Plan now is to concentrate activities of Piasecki Aircraft Corp. in the field of vertical lift aircraft for the U. S. military services, and for licensing and production of VTOL aircraft internationally.

ADMINISTRATION'S FOREIGN AID PROGRAM received serious setback July 11 when House by roll-call vote of 251 to 123 approved cut of $627.9 million, about 20% less than President Eisenhower had asked. Final amount approved was $2,638,741,750. House action followed disclosure by Sen. Mike Mansfield (D-Mont.) that Defense Department had earmarked more than a half-billion dollars during last 24 hours of June to beat fiscal year deadline.

Biggest part of cut was $420 million for military assistance. Appropriations Committee, justifying reduction, said there had been "written understanding" between Committee and Defense officials that this amount should not be released by Budget Bureau in view of fact that nearly a billion dollars of previously appropriated funds were unobligated at end of fiscal year.

MANAGEMENT STUDY OF CIVIL AERONAUTICS ADMINISTRATION, conducted last year by consulting firm of Cresap, McCormack and Paget, is by no means a dead issue. First task given new CAA Deputy Administrator Lowen calls for evaluation of the CMP report, CAA's analysis of its findings and a third document authored by Colin McIntosh, who as a Commerce consultant also evaluated the CMP report. Lowen is scheduled to report his findings directly to Commerce Under Secretary for Transportation Louis B. Rothschild.

Long lapse before revival of CAA study was forced by Congress last year when it restrained Commerce from any large-scale CAA reorganization without its prior approval. Whether such a restriction will still apply to new Under Secretary Rothschild, in light of his good standing with Congress, remains a moot question.

BRITAIN'S GLOSTER JAVELIN all-weather fighter, now slated for RAF squadron service under partial U.S. support, is being eyed by both American and British authorities for possible cancellation, foreign press reports imply. About 200 Javelins of the FAW 1 version are believed to be involved, and indications are that a time limit has already been set on acceptance into squadron service.

Although specifics of Javelin difficulties remain undisclosed, wing airflow is said to be still under investigation at this late stage in development, when the aircraft is undergoing acceptance trials at Farnborough.

NEW $50-MILLION AIR FORCE CONTRACT awarded Allison Div., General Motors Corp. extends production of its T56 turboprop engine from April, 1956 through 1957 at a continuing accelerated pace. The T56s will power the Lockheed C-130, AF's first turboprop transport. Engine is also slated for the Lockheed Electra—first U. S. commercial turboprop to win an airline order.

Final decision on use in the Electra, however, is not expected until Robert E. Gross, Lockheed president, and C. R. Smith, AA head, return from a three-weeks' visit to England where they are making a final check on the Rolls-Royce RB-109. Eastern Air Lines' decision on the Electra is also said to await Gross' return.

Freedom Has a New Sound!

ALL OVER AMERICA these days the blast of supersonic flight is shattering the old familiar sounds of city and countryside.

At U.S. Air Force bases strategically located near key cities our Airmen maintain their *round the clock* vigil, ready to take off on a moment's notice in jet aircraft like Convair's F-102A all-weather interceptor. Every flight has only one purpose—your personal protection!

The next time jets thunder overhead, remember that the pilots who fly them are not willful disturbers of your peace; they are patriotic young Americans affirming *your New Sound of Freedom!*

PUBLISHED FOR BETTER UNDERSTANDING OF THE MISSION OF THE U.S.A.F. AIR DEFENSE COMMAND

CONVAIR

A DIVISION OF GENERAL DYNAMICS CORPORATION

NORTH AMERICAN's T-28B Navy trainers are equipped with Hamilton Standard propellers, traditionally used on both Air Force and Navy trainers as well as on leading military and commercial aircraft. Years of aviation experience, the highest engineering skills and unsurpassed modern facilities lie behind these propellers, and other *basic lines* * of equipment which Hamilton Standard is producing for jet and piston-engined aircraft.

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Wherever Man Flies

Propellers * Starters * Air Conditioning Systems * Fuel Controls * Valves * Pumps

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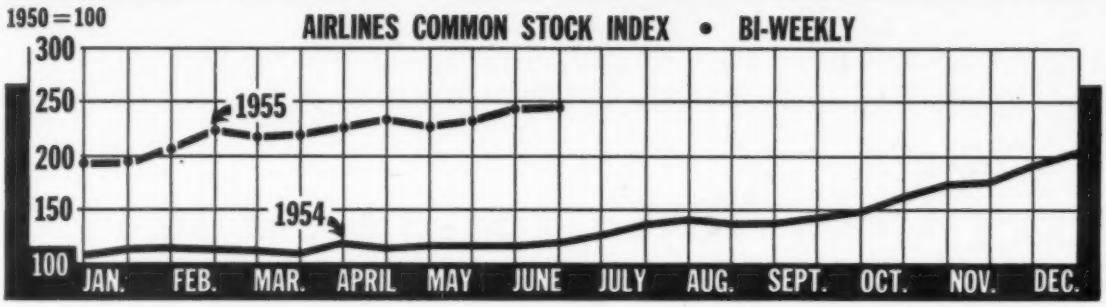

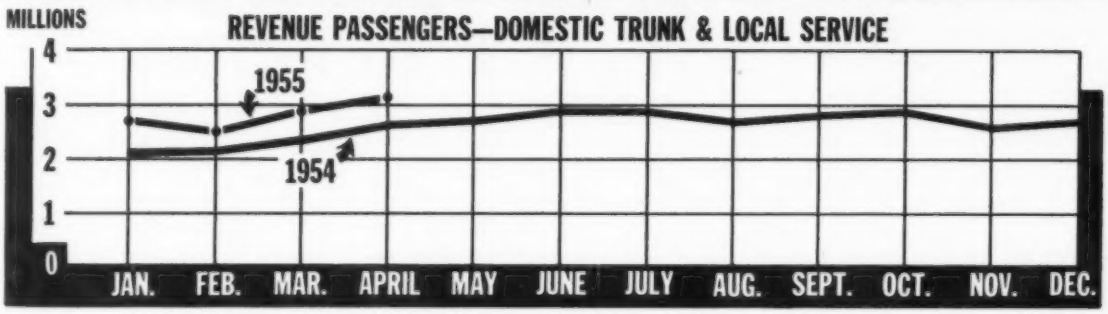

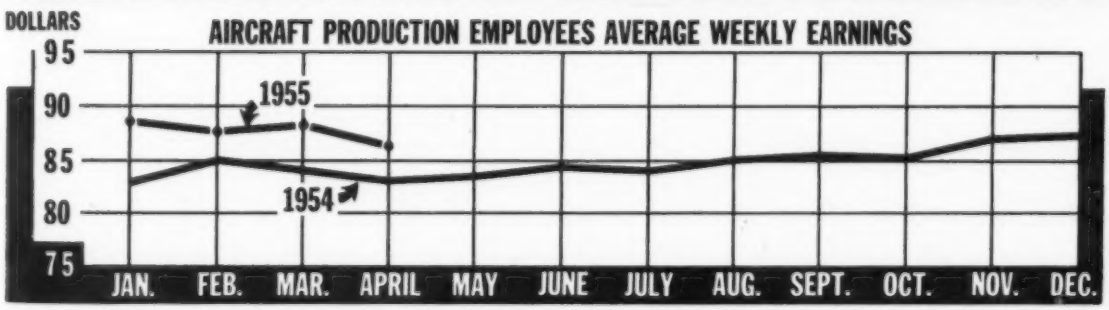

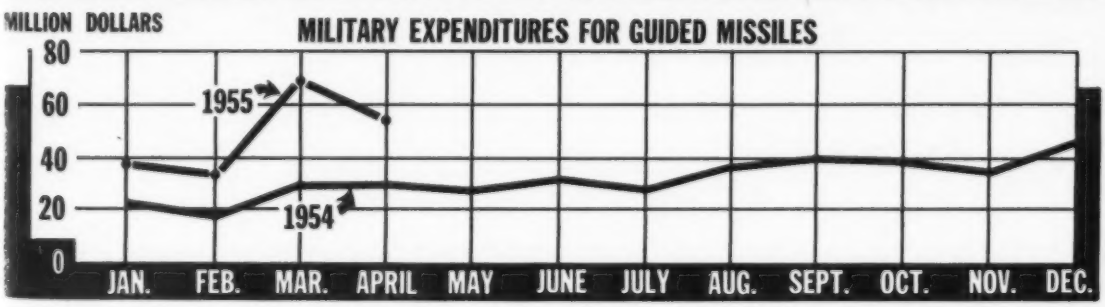

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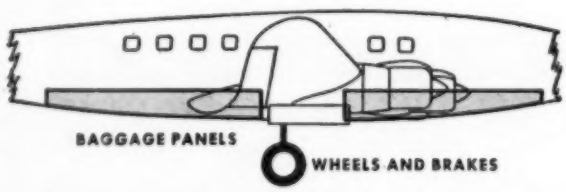
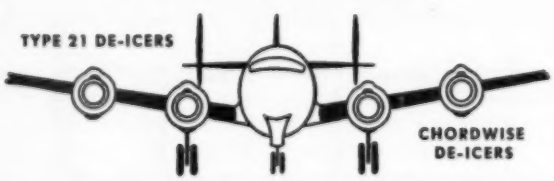
RESEARCH KEEPS **B.F.Goodrich** FIRST IN RUBBER

Every time Northwest's new 1049-G's land, stop, get up and go— they rely on B. F. Goodrich

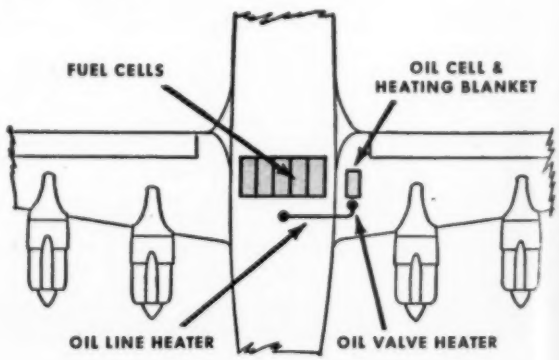
NEW LOCKHEED 1049-G Turbo Constellations—the latest addition to Northwest Orient Airlines' fleet—offer the ultimate in dependability.



B. F. Goodrich brakes stop this plane smoothly; give long service with low maintenance, more even wear. When fluid pressure is introduced, a full circle "tube" lifts each brake block evenly around the full circle of the drum. The entire braking surface is utilized. **B. F. Goodrich wheels** are made of magnesium alloy for great strength with light weight. The new **B. F. Goodrich baggage panels** are air-tight yet easily opened, strong yet flexible. Made of a glass fabric combined with a special rubber compound, they're opened by **B. F. Goodrich Pressure Sealing Zippers.**



The wings of Northwest's 1049-G's have the most efficient ice protection yet developed—new **B. F. Goodrich chordwise De-Icers.** The small rubber tubes that inflate to snap off ice are built chordwise, in line with the airstream. They maintain a smooth flow of air over the wings even during the 3-second inflation cycle. Like **B. F. Goodrich Type 21 De-Icers** on the tail, they remove ice effectively with a high pressure snap.



B. F. Goodrich fuel cells add to flight range, yet take up minimum space. **B. F. Goodrich oil cells** contain **electrically heated rubber "blankets"** that keep oil at proper temperature. **Heated rubber "jackets"** around oil valves assure positive action at all times. And **BFG oil line heaters** keep oil flowing freely.

These are typical examples of the many B. F. Goodrich aviation developments that help keep modern airliners on the go from take-off to landing. *The B. F. Goodrich Co., Aeronautical Sales, Akron, Ohio.*

ESTABLISHED JUNE 1, 1937

World's Largest Aviation Publishers
American Aviation

VOL. 19, NO. 4

Industry Faces New Lineup of Defense Officials

- **Talbott and Lewis expected to resign soon.**
- **New team must cope with Reds' growing air might.**

By ROBERT M. LOEBELSON

THE AIRCRAFT industry last week resigned itself to the prospect of dealing with a new team of civilian and military officials in the very near future and the changes in plane production that might ensue.

Although no announcement was forthcoming either from the White House or the Pentagon, it was definite that:

• **Air Force Secretary** Harold E. Talbott soon would leave public service for health reasons.

• **Assistant Air Force Secretary** for Materiel Roger Lewis would resign in September to accept a position with a Toledo, Ohio, firm, probably Electric Auto-Lite Co.

Also reportedly ready for transfer to Europe soon is Air Force Gen. Edwin W. Rawlings, who has been commander of the Air Materiel Command at Dayton since 1951.

Coupled with the recent retirement of Lt. Gen. Bryant L. Boatner as Deputy Chief of Staff-Materiel and his replacement by Lt. Gen. Clarence S. Irvine, the resignations and reassignments mean that the Air Force would very shortly have a brand-new lineup of top officers and civilians on the materiel side.

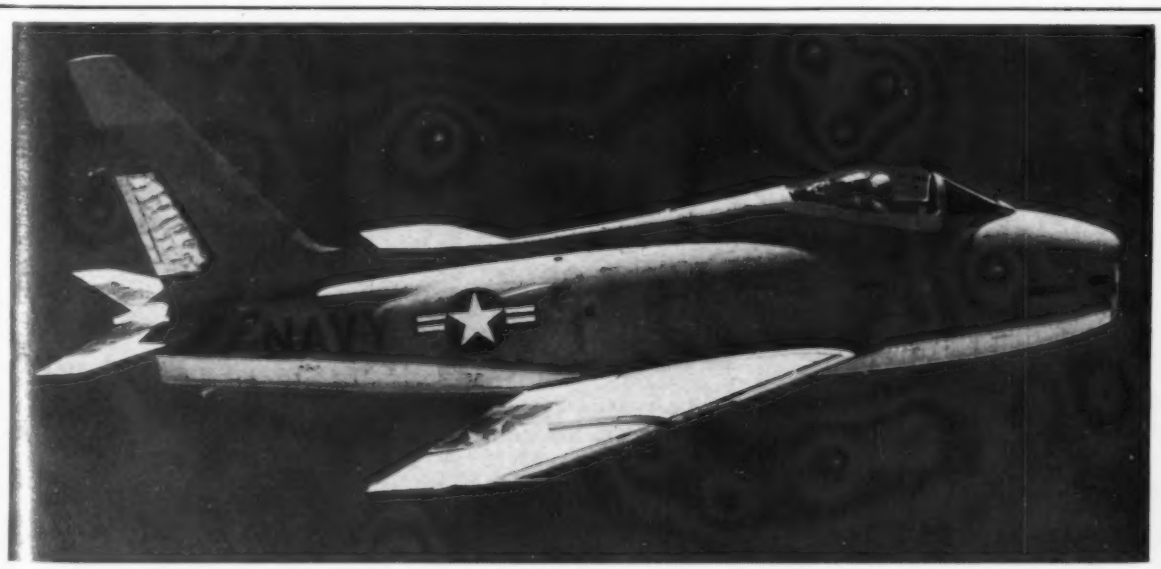
• **These men,** whoever they turn out to be, will be immediately confronted with a re-review of the actions taken by Talbott and Lewis in ordering stepped up production of the Boeing B-52, McDonald F-101, and Lockheed F-102 to meet the threat of new Russian airplane types.

In conjunction with AF Chief of Staff Gen. Nathan F. Twining and Vice Chief Gen. Thomas D. White, the incoming Air Secretary and Assistant Secretary for Materiel will have to decide quickly whether the planned 35% increase of the eight-jet intercontinental bomber and the sharply upgraded production schedules for the supersonic McDonnell Voodoo and the Lockheed day fighter are sufficient.

If these men feel that possibly these increases are insufficient, or perhaps, that output of still other aircraft models (e.g. Boeing KC-135 jet tanker, Convair F-102 interceptor at a second source) should also be accelerated, they will have to ask Congress, which probably will have adjourned by that time, for supplemental appropriations.

• **Other problems** that the new team will have to reanalyze quickly include possible acceleration of the development of the atomic-powered bomber (AMERICAN AVIATION, July 4) and the intercontinental Atlas ballistics missile.

Lending a certain amount of stability to the changing personnel picture are Twining and White, both of whom have been living with the problem for more than two years as chief and vice chief, and Irvine, who is no novice at plane production problems. Although Irvine has held the DCS-Materiel post only since April, he previously spent a couple of years as AMC's deputy commander for production and commuted to the Pentagon's DCS-Materiel office



NAVY'S NEW FJ-4 FURY is shown in latest two-toned gray and white colors. New color scheme has been adopted by Navy for all its planes now coming off assembly lines. Fury is painted gull gray at wing root level and above, white below. The FJ-4, in production at North American Aviation's Columbus, Ohio, plant, is powered by a 7,800-lbs.-thrust Wright J65-W4 turbojet.

on a regular basis during that period.

Talbott's resignation from the Pentagon will be announced as being for health reasons. Such a reason is usually met with cynicism, but in this particular case it happens to be true. Since taking over as AF Secretary early in 1953, Talbott, who is now 67, has spent a good part of that time on the road.

(Talbott, incidentally, is to be joined in resigning by Navy Secretary Charles S. Thomas, according to reliable reports. Since former Army Secretary Robert T. Stevens already has left and Deputy Defense Secretary Robert B. Anderson has submitted his resignation, only Defense Secretary Charles E. Wilson remains from the original Eisenhower Defense team. Wilson, Talbott, Anderson, Thomas, Stevens and Roger Kyes all moved into top positions when the Eisenhower Administration took over in January 1953. Kyes resigned a year ago to rejoin General Motors Corp.)

• **Roger Lewis,** who will leave in September if a replacement can be found by that time, also has held his post since early 1953. A veteran International Business Machines executive, David C. Moore, who became a special assistant to Lewis in March, has been offered the AF materiel position but is understood to have turned it down.

General Rawlings is said to be slated for the post now held by Gen. Orval R. Cook as deputy commander in chief for the U. S. European Command. The former USAF comptroller, Rawlings has kept tight rein on contracts awarded to the aircraft industry. His successor may or may not be as strict, depending perhaps, on the new Air Force Secretary and Assistant Secretary for Materiel.

In any case, the Russians are not doing anything to make the decisions faced by the incoming officers and civilians any easier. The Soviets followed up their displays of production quantities of intercontinental and medium range jet bombers and new fighters during the May Day rehearsals with another air show over the Fourth of July week-end.

• **Observers disagree** as to whether any of the types shown early in July were any different or superior to those demonstrated late in April.

According to Defense Secretary Wilson, the Russians, just before May Day, showed off:

• More than 50 supersonic day fighters.

• More than 30 new all-weather interceptors.

• More than 40 new Type 39 Badger twin-jet medium bombers.

• Ten or more Type 37 Bison four-jet intercontinental bombers.

• Nine turboprop-powered bombers or tankers.

The Pentagon has not yet indicated what its air attaches in Moscow reported about the July display, but Britain's Defense Minister, Selwyn Lloyd, told the House of Commons that the July fly-bys did not include any jet fighters or bombers not previously seen.

• **According to wire service** dispatches from Moscow, however, at least two of the fighter types and a single jet-transport prototype were brand new. At the July show, the Reds flew more than 400 planes, including:

• Fifty twin-jet all-weather fighters, with one engine slung underneath each wing and radar-packed noses.

• Almost 50 single-jet supersonic fighters.

• Seven turboprop bombers.

• Twelve Bisons.

• Twenty-four Badgers.

• One two-engine jet transport about the size of the British Comet.

• Four twin-rotor and 36 single-rotor helicopters.

• One flapping-wing glider.

These displays of Russian air might, which have resulted in thousands of letters from the public to the Air Force and demands by several Senators for a Pentagon report giving all "the facts" and pictures of the new Soviet planes, will be the biggest headache for the new Air Force officials. Their task will certainly not be an easy one.

And their decisions (whether they follow Talbott's and Lewis' exactly or modify them to a degree) may well determine the nation's fate. • • •

ICC Chairman Suggests Railroad Subsidies

Interstate Commerce Commission Chairman Richard R. Mitchell last month suggested Federal subsidies for railroad passenger services which incur annual deficits of $400,000,000 to $600,000,000.

Said Mitchell: "If passenger trains are needed in the public interest, why shouldn't the public assist in carrying the cost instead of forcing on the shippers of the nation the burden of paying the passenger deficit."

Mitchell's idea was supported by one top rail official, Robert R. Young, chairman of the New York Central, who said "We in Central would rather give good service and be subsidized than to give poor service and be criticized."

But reaction of most rail officials was described as "cool" to Mitchell's recommendation. The ICC head was also attacked in various newspaper editorials as having spoken outside the scope of his quasi-judicial status.

The suggestion stirred mixed reaction on Capitol Hill. There were some signs that Mitchell might be called before the Senate Commerce Committee to expound on the idea.

Altschul Joins AMERICAN AVIATION As Contributing Financial Editor

Selig Altschul, veteran independent aviation consultant, is now associated with American Aviation Publications as contributing financial editor, according to announcement by Wayne W. Parrish, editor and publisher.

Mr. Altschul, who has been contributing financial editor of *Aviation Week* and its predecessor *Aviation* since 1939, has severed his association with that publication to write for AMERICAN AVIATION readers. His first article appears in this issue on page 34.

He brings a wealth of financial background to his readers, dating from 1936 when he was research and investment analyst with Chicago financial institutions. He served as head analyst of the Civil Aeronautics Board in 1942-43 and 1945-56, taking time out for service with the Strategic Bombing Survey in Germany during World War II.

He established his aviation consulting practice in New York in January 1947, and is registered with the Securities and Exchange Commission as an investment adviser specializing in aviation matters. In this capacity, he prepares independent analyses and surveys for banks, investment firms and other financial groups as well as reports and evaluations directly for airlines and aircraft companies.

Mr. Altschul has been an independent aviation consultant longer than anyone else in the field.

As consultant to the Hoover Commission, he conducted a task force study of the Military Air Transport Service earlier this year.

Mr. Altschul also has contributed articles to *Barron's, Public Utilities Fortnightly, Nation's Business* and other publications.

Electra Has Flexibility, Efficiency, Economy

Here are first details of Lockheed's new turboprop

By FRED HUNTER

FULL details on the Lockheed Aircraft Corp.'s Electra spell out the operational flexibility of the first commercial turboprop airliner of U. S. design.

Lockheed's claim for its forthcoming transport: "A design which in its overall effect will advance the state of the art in air transportation."

The Electra, Lockheed adds, will have "better performance and economy than transports currently in use."

Lockheed's powerplant selection for the Electra is Allison's 501-D10. Later on, advanced Allison 501-D8s—which would increase the cruising speed to 425 mph—could be used. British engines also may become alternate powerplants. American Airlines, first purchaser of the turboprop, has evidenced so much interest in the Rolls Royce RB-109 that it placed its order for 35 Electras with the power left open for later decision. There is practically no chance, however, for the British engine maker to match Lockheed's production schedules on the first lot of AA planes.

• **Meanwhile, Lockheed** points out that the large production under way on the T56 military counterpart of the 501 assures the rapid development of the engine as a reliable commercial power plant.

Following are performance highlights of the Electra equipped with four Allison 501-D10 engines:

Range, 1,850 miles with 18,000-pound payload against 50 mph headwind, with fuel reserve of 7,000 pounds.

Cruising speed of 414 mph at 25,000 feet at 80,000 pounds.

Field length of 4,590 feet for take-off at maximum gross weight of 98,500 pounds at sea level on a standard day, and 6,000 feet on a 90 degree F. day.

Landing field length of 5,440 feet for maximum structural design landing weight of 88,600 pounds, and 4,920 feet for normal landing weight of 80,000 pounds.

Climb to 25,000 feet altitude in 21 minutes at maximum take-off gross weight of 98,500 pounds; to 15,000 feet in 8½ minutes.

• **The Electra's power plant** installation embodies several advanced design features which Lockheed says have been established through its experience in turbine-powered aircraft. One of these is the division of each nacelle into three fire zones, isolated from each other with stainless steel firewalls, and provided with latest fire surveillance and high rate discharge fire extinguishing systems.

The "coke bottle" shape of the tailpipe fairing over the maximum thickness of the wing illustrates the attention Lockheed has given to the aerodynamics of the nacelles, both internally and externally, to achieve low nacelle drag and high propulsive efficiency.

Ready accessibility is provided for all areas of the engine and accessory compartments where experience with turbine installations has shown it to be desirable. Large hinged panels forward of the firewall provide access to the compressor, gear box, engine accessories and oil tank. These are secured with quick-opening latches. The entire panel sections also may be readily disconnected at the hinges for removal if this is desired. Easily removable panels secured with quick-opening latches provide access to the turbine section and tailpipe aft of the firewall.

• **The power plant** is designed as a quick engine change unit, or power package, and may be installed or removed complete with cowling and propeller. All power plants are interchangeable across the airplane except for a small number of engine-mounted accessories which are peculiar to engine location and must be handled separately.

Normal fuel reserve for the Electra is set at 8,000 pounds and is based on a two-hour hold at 1.3 Vmd at 5,000 feet altitude with all engines operating. Holding at higher altitudes, the fuel lasts longer: 2¼ hours at 15,000 feet, or 2¾ hours at 30,000 feet.

Distances to alternate which could be accomplished on the basis of the 8,000-pound reserve, retaining in each case a ¾-hour supply of holding fuel, are calculated as follows: 290 miles at 5,000

Lockheed Aircraft Corp.'s Turboprop Electra

Dimensions and Areas

Wing Area	1200 sq. ft.
Wing Span	95 ft. 6 in.
Wing Root Chord	217 in.
Wing Tip Chord	86.5 in.
Wing Dihedral	5 degrees
Horizontal Tail Area	310 sq. ft.
Vertical Tail Area	202 sq. ft.
Fuselage Length	101 ft. 4 in.
Fuselage Outside Diameter	136 in.
Height Over Tail	34 feet
Main Landing Gear Tread	28 ft. 8 in.
Wheel Base	34 ft. 9 in.

Structural Data and Weights

Takeoff Design Gross Weight	98,500 lbs.
Landing Design Gross Weight	88,600 lbs.
Zero Fuel Weight	71,830 lbs.
Weight Empty	51,230 lbs.
Operating Weight	53,830 lbs.
Payload	18,000 lbs.
Fuel	26,670 lbs.
Limit Maneuver Load Factors	Positive 2.50; Negative 1.00
Limit Gust Load Criteria	30 f.p.s. up to 335 knots TIAS
Design Limit Diving Speed	420 knots TIAS below 7,000 ft. alt. Mach .725 above 7,000 ft.
Design Limit Level Flight Speed	335 knots TIAS below 11,000 ft. alt. Mach .625 above 11,000 ft.

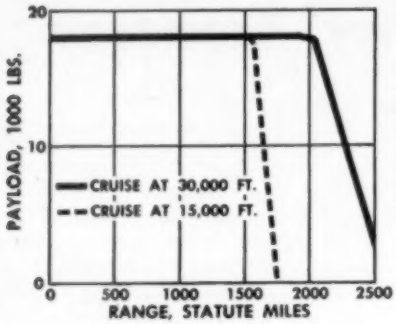
Power

Engine: Allison Turboprop Model 501-D10

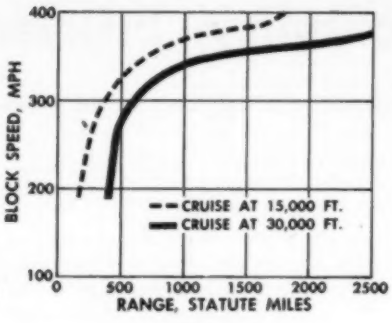
Ratings	RPM	ESHP	SFC (lb/hr/eshp)
Takeoff	13,820	3,750	0.540
Max. Continuous	13,820	3,375	0.552
Cruise (80%)	13,820	2,700	0.589
Cruise (60%)	13,820	2,025	0.661
Ground Idle	10,000	.....	1.45

Systems

Electrical system 3-phase 208/120 volt, 400 cycle A.C.
Low voltage D.C. is provided by rectifiers
Hydraulic system 3,000 psi
Pneumatic system 3,000 psi for initial engine starting.



Payload Range



Block Speed

feet; 375 miles at 15,000 feet, 555 miles at 30,000 feet.

• **For short range operation** it will be more economical to operate the new Electra at a cruising altitude of 15,000 feet, but for ranges of 1200 miles or more a higher altitude will be more economical. The Electra's cabin will be pressurized to a maximum altitude of 8,000 feet at an airplane altitude of 30,000 feet. Pressure will be furnished by engine-driven compressors, providing dual reliability against loss of pressure in flight.

Cabin sidewalls will be heated for cold weather operation, An air cycle cooling system will provide comfort for lower-altitude operation in summer. In addition, a self-contained vapor-cycle ground cooling system will be available whenever an engine is running or when an external source of electrical power is plugged in. No ground air conditioning trucks will be required.

Simplicity of all structures and systems has been a major objective in the Electra design development, Lockheed reports. A specific example of this policy is the rugged and very conventional landing gear. The nose gear is fuselage-mounted under the cockpit floor; the main gear is wing-mounted, retracting into the inboard nacelles. Actuation is hydraulic, shock absorption is by conventional oleo-pneumatic struts, up-latches are mechanical, and the gear will free-fall and lock in all flight attitudes. The gear will not retract while on the ground unless hydraulic power is applied. The main gear support is well separated from the wing fuel tanks.

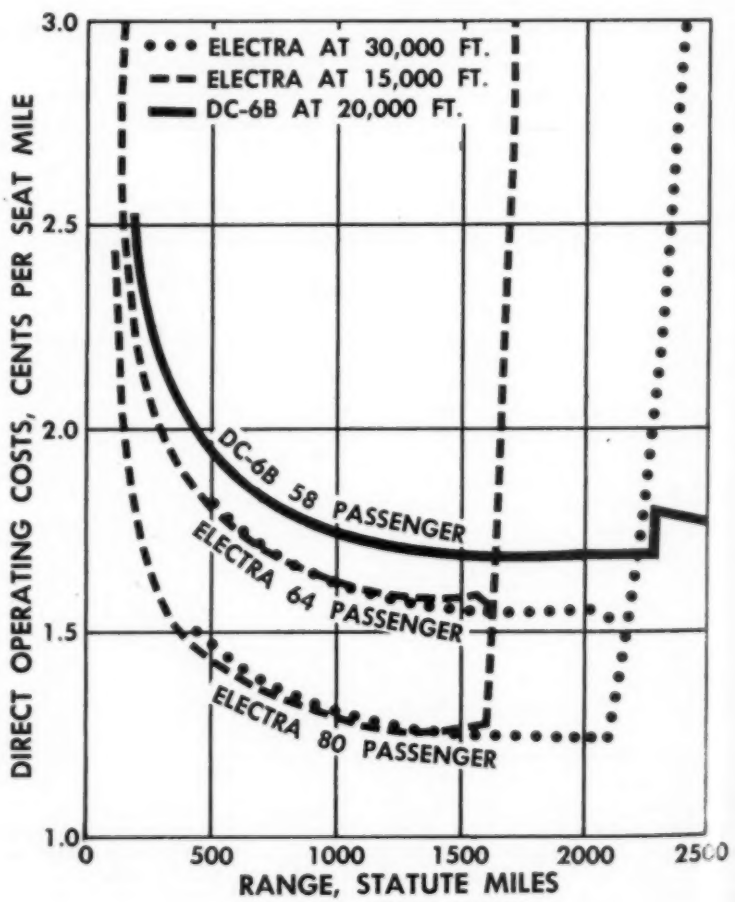
The Lockheed turboprop incorporates a single-point refueling system, which is installed beneath the wing fillet on the right hand side. Fuel capacity is 4,178 gallons in four integral tanks.

• **Ground servicing requirements** are designed to be essentially identical to those now required for current piston-engine transports. The need for special ground air-compressor units for engine starting has been eliminated by a self-contained starting system connected to the two outboard engines. This feature makes the airplane independent of special equipment and thus simplifies the problem of operating through small stations or from alternate airports. Structural strength for landing at high gross weights permits operation through en route stations without refueling.

Lockheed has designed a new passenger seat to capitalize on the inside cabin diameter of 128 inches. In the 64-passenger four-abreast arrangement, the width of the seat is 20 inches between armrests, leaving a center aisle 28 inches wide. Spacing between rows is 38 inches and basic window spacing is the same. Each seat is provided with its own tray, and with an adjustable footrest. Cabin's ceiling height is 83 inches above the floor.

A universal rail system allows fore-and-aft spacing between seats to be readily changed and permits quick conversion to five-abreast high density seating for 80 passengers. The five-abreast seats are 17½ inches wide between armrests, except for the center unit of the triple group, which is 18 inches. Aisle width is 18 inches. Both interiors provide a larger-than-usual six-seat lounge, open to the cabin by the use of half-partitions on the left side.

• **The new-type windows** are described as creating an unusually light and open appearance in the cabin. They also provide a wide angle of vision for the passengers. Dimensions of the clear window areas are 16 by 20 inches, with the long dimension vertical. Bottom sills have been lowered approximately two inches to improve the range of downward vision. The windows are double strength for safety, with the primary



Operating Costs for the Electra.

load-carrying panel protected from damage. They are designed to prevent fogging or defrosting at all times.

The Electra's built-in stairs (forward) and luggage racks are designed for more efficient passenger handling. A 75-cubic foot luggage rack with suitable shelves and luggage retainers is located aft of, and immediately adjacent to the main passenger door. A coat compartment opposite provides overflow luggage space if needed. In the 80-passenger arrangement, the coat compartment is replaced by a 100-cubic foot luggage rack, making a total of 175 cubic feet of space.

For checked luggage, a 142-cubic foot underfloor compartment is located forward of the wing, convenient to the passenger entrance door. This compartment has its own door, 36 by 36 inches in size, located on the right-hand side of the airplane.

There are two pressurized underfloor cargo compartments, one of 136 cubic feet capacity forward, and one of 180 cubic feet capacity aft. The forward compartment has one door 36x36 inches. The aft compartment has two doors, one 36x36 inches, the other 36x25 inches.

All pressure doors in the Electra are inward opening to prevent accidental opening in flight. In addition to the main passenger door, there are eight emergency exits, including two large doors at the rear of the cabin.

• **Cockpit arrangement** provides for a three-man flight crew, plus an observer. The flight engineer is stationed between the pilot and copilot and slightly aft in the SAE type 11 cockpit. Windshields and window panels provide a wide field of vision and full headroom is provided over all aisle areas.

Arrangement of controls, instruments, and lighting is in close conformity to the recommended practices of SAE Committee S-7. Emergency controls are accessible to all three crew members.

Power controls are duplicated on the control pedestal to improve accessibility. Other controls on the pedestal include landing gear, flight idle release gate, fuel control panel, flaps and radio.

Landing gear and flap controls have distinctive handles and are well separated to guard against inadvertent actuation. The floor aft of the pedestal is left completely clear to prevent confusion and to allow more room at the flight engineer's feet.

• **The center of gravity envelope** illustrates the good balance characteristics of the Electra. Center of gravity remains well within limits, 16 degrees forward and 2 degrees aft, for the usual loading of window seats first and aisle seats last, even for the worst random conditions where loading takes place from aft seats forward or forward seats aft.

Location of two cargo compartments below the floor in forward and aft positions ensures good balance characteristics at all airplane weights, requiring only a reasonable control of cargo distribution.

Other Electra features include: spring tab flight control system, integrally stiffened wing skin construction, steerable nose wheel, flush antennae (except HF), two stewardess seats (one forward, one aft), de-lethalized seat backs, flotation-type seat cushions, and de-icing for NACA heavy ice. • • •

Outlook Bright for Quick Passage Of $252-Million Airport Aid Bill

Outlook for enactment of the $252-million contract authorization bill for federal aid to airports was increasingly bright last week following Senate passage of the Monroney bill recommendations by the Commission on Intergovernmental Relations that cost-sharing basis of federal aid be continued, and quick scheduling of House hearings on a bill similar to the Senate version.

The Senate passed the Monroney bill without dissent the last week in June. A few days later the Presidential Commission report was released. The two events are credited with the House action, since it had been expected that the Commerce Committee would not take the time to consider the measure at this session.

The final version of the Senate bill as passed to amend the Federal Airport Act incorporated several suggestions made by the National Association of State Aviation Officials, and contained provisions closely following the Commission report. In addition to the stated primary purpose of the bill, which is to provide annual contract authority

How the $63-Million Annual Authorization Federal-aid Program will be Distributed

State	Apportionment	State	Apportionment
Alabama	$ 836,180	Nebraska	$ 759,013
Arizona	939,544	Nevada	827,050
Arkansas	670,938	New Hampshire	147,216
California	2,734,099	New Jersey	781,667
Colorado	955,269	New Mexico	985,691
Connecticut	340,256	New York	2,606,233
Delaware	64,980	North Carolina	989,458
D. C.	120,271	North Dakota	605,945
Florida	351,856	Ohio	1,511,101
Georgia	942,419	Oklahoma	841,462
Idaho	694,985	Oregon	932,127
Illinois	1,721,651	Pennsylvania	1,902,130
Indiana	852,738	Rhode Island	127,157
Iowa	800,327	South Carolina	542,723
Kansas	882,263	South Dakota	657,256
Kentucky	733,174	Tennessee	798,404
Louisiana	760,599	Texas	3,093,777
Maine	385,763	Utah	719,824
Maryland	439,234	Vermont	126,216
Massachusetts	767,262	Virginia	803,025
Michigan	1,654,594	Washington	863,070
Minnesota	1,072,185	West Virginia	475,132
Mississippi	676,053	Wisconsin	993,906
Missouri	1,096,682	Wyoming	754,789
Montana	1,157,301		

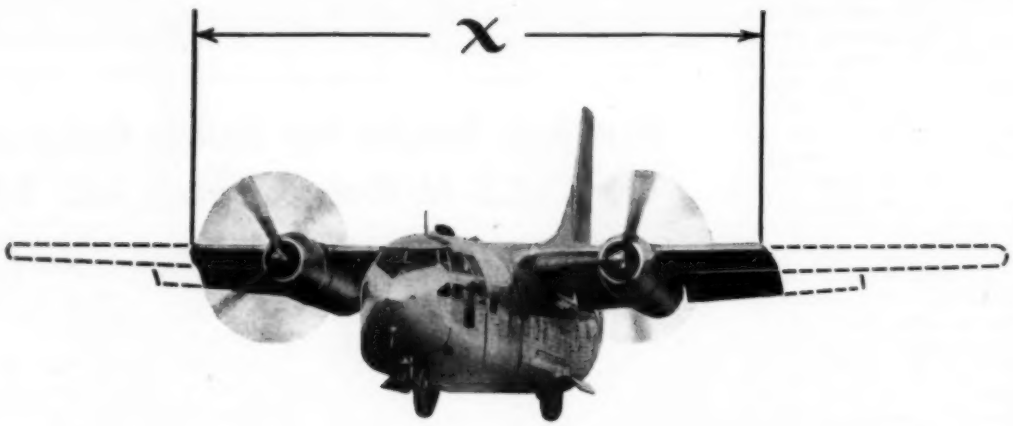
Total State Apportionment	$45,000,000
Discretionary Funds	15,000,000
Total funds for continental United States	60,000,000

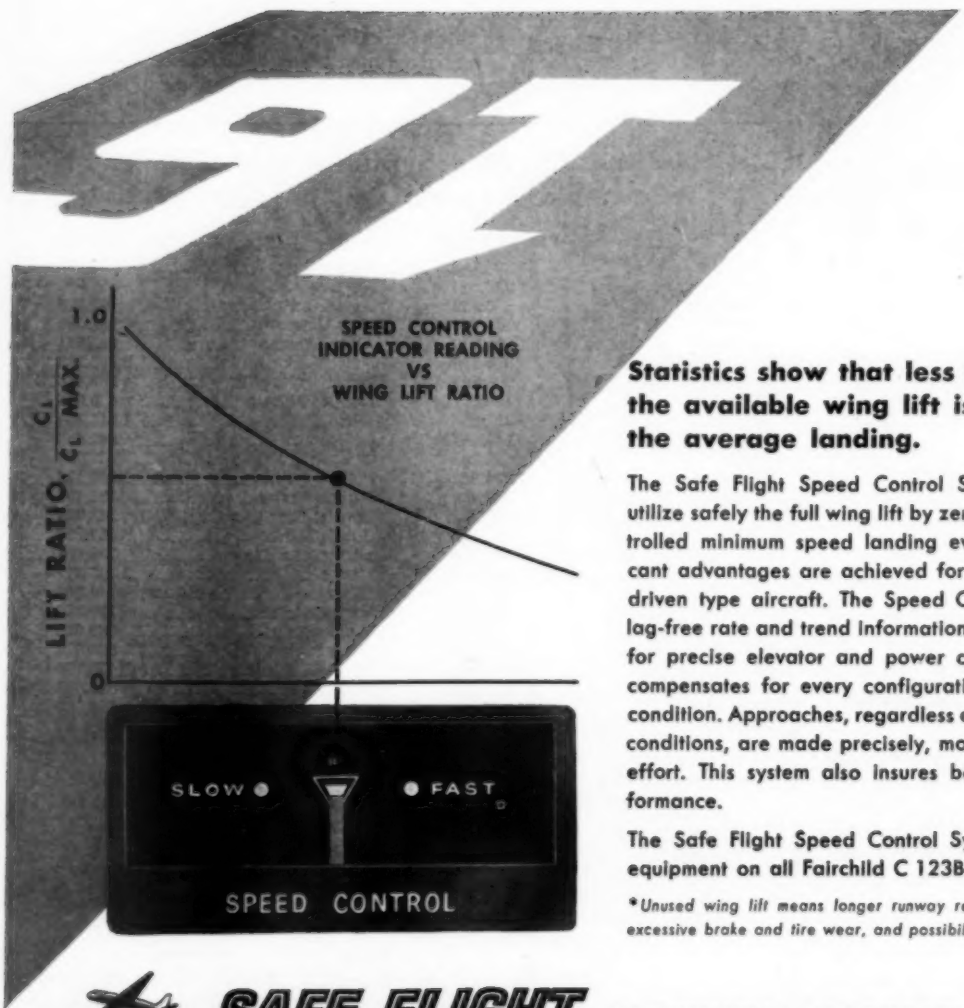
Territories

Alaska	$1,350,000
Hawaii	750,000
Puerto Rico	600,000
Virgin Islands	300,000
Total	$3,000,000
Grand total	$63,000,000 (See Note)

Note: An additional $20 million will be available in fiscal 1956 to be added to the new authorization if finally approved with $15 million for state apportionment and $5 million for discretionary fund.

How much* of the available WING LIFT are YOU using?





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  As much as 60% lighter!
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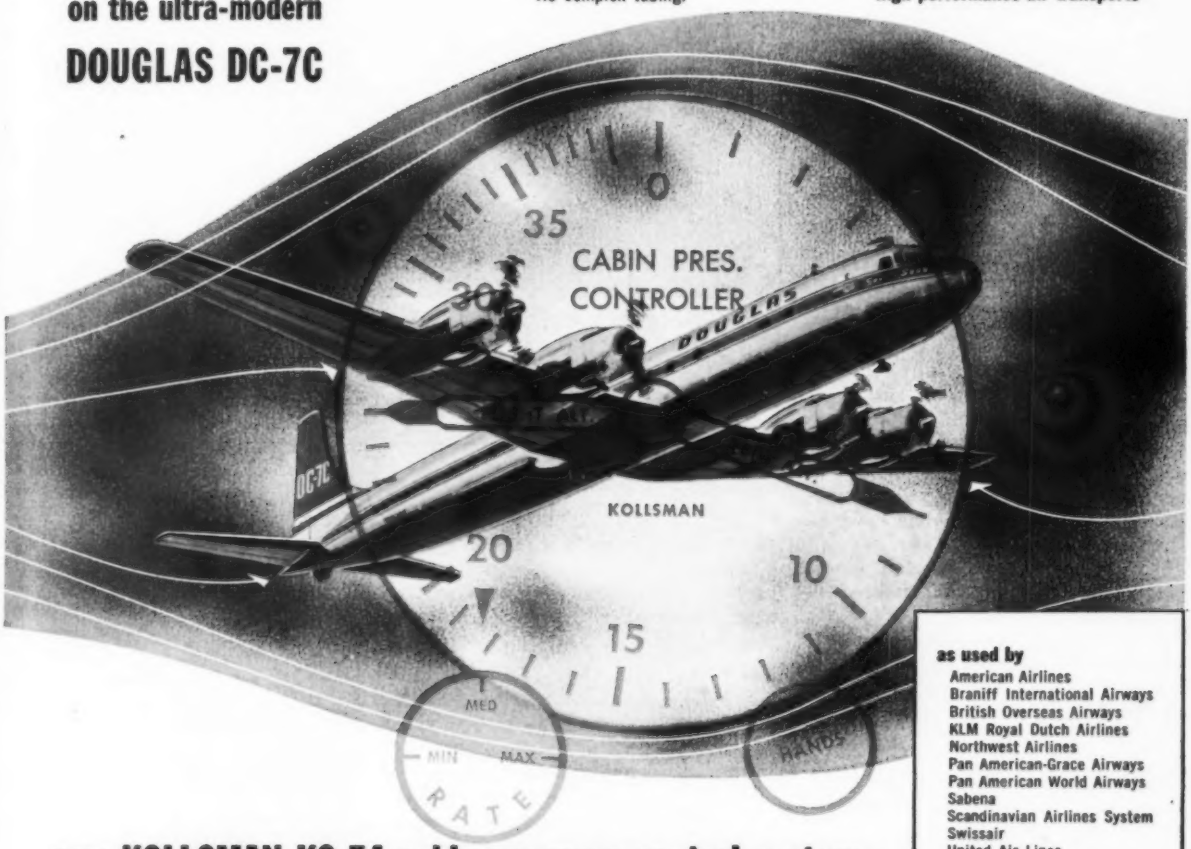

as used by
American Airlines
Braniff International Airways
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in the amount of $63 million for each of the fiscal years 1956, 1957, 1958 and 1959, the bill amends the Act, according to the committee report to:

• **Make it clear** that the Department of Commerce is not to consider "ineligible for federal aid the development of any class of terminal buildings, or the accomplishment of any other type of airport development legally eligible under the Federal Airport Act but instead is expected to make grants, within the limits of available authorized funds for all legally eligible types of projects to the extent that they are determined to be necessary to meet the needs of civil aviation on a case-by-case basis."

• **Extent to two fiscal years** the period of time "within which apportioned funds shall remain available for use only in the states for which they are apportioned."

• **Prescribe a deadline** of March 31 for the preparation and adoption of each annual revision of the national airport plan.

• **Eliminate the present requirement** that the Secretary of Commerce submit to the Congress each year a list of proposed projects for the development of large airports.

If, as now expected, the House passes a similar measure $83 million will be available for fiscal 1956, since the CAA budget as passed by Congress provides for $20 million in airport aid. The subsequent three fiscal years will revert to the $63 million—$60 million for the states and $3 million for the territories.

Other aspects of the Monroney Act closely correspond to some of the recommendations made by the Presidential Commission. These are:

• **That the present system** of apportioning 75% among states on an area-population basis and the remaining 25% through CAA's discretionary fund be continued.

• **That Congress clarify** its intent regarding distribution of federal grants as between smaller and larger airports.

• **That Congress authorize** appropriations for at least two years in advance and that funds be available for expenditures after the close of the fiscal year for which authorized.

• **That each State continue** to be allowed to determine whether federal aid should be channeled through state agencies or directly through government airport sponsors.

In addition, the commission strongly urged that stimulation of airport development on a regional basis be encouraged. It suggested that port authorities, similar to that in New York, be set up as the tool for such development work.

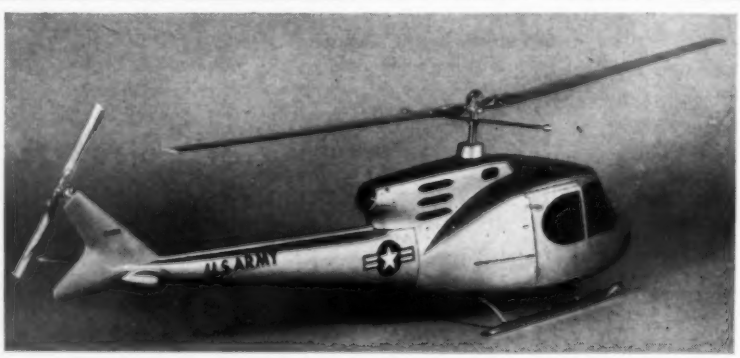
Final commission recommendation called for CAA to expedite its fiscal audits of federally-aided airport projects. "Acceleration of federal payments," it observed, "will contribute to reduction of construction costs and tend to alleviate frictions and misunderstandings."

Ironically, the special committee's report, so strongly favoring continued and larger federal aid, came shortly after the Administration raised its lone voice in opposing all aspects of the Monroney Act.

If the House transportation subcommittee, under the chairmanship of Oren Harris (D-Ark.) moves as rapidly as now indicated, the House contract authorization program should be on the floor for voting within the next few days. If passed and signed into law, fiscal 1956 appropriation of $83 million and the subsequent $63 million authorizations will represent the largest amounts yet available since the enactment of the original Act.

The $45 million appropriated in fiscal 1947 was the largest to date. Appropriations decreased steadily each year thereafter until the "moratorium" in 1953, when no money was made available. For fiscal 1955 the appropriation was $20 million. • • •

IAS AWARD WINNERS honored during recent 5th International Aeronautical Conference in Los Angeles are shown here with Lockheed Aircraft Corp. president Robert E. Gross (center), 1955 IAS president. Thurman H. Bane Award went to Dr. Gottfried Guderley (left) and Octave Chanute Award to Maj. Gen. Albert Boyd, both of Wright Air Development Center. Maj. Gen. Donald Putt (right) accepted the Chanute award in Boyd's absence.



LIGHTWEIGHT XH-40 utility helicopter being developed for the U. S. Army by Bell Aircraft Corp. is shown here in first model photo. XH-40 is designed for front line evacuation and instrument training and is rated to carry 800-pound cargo at speeds exceeding 100 knots. Powerplant still is classified, but is believed to be a Lycoming VO-435 derated to 260 hp.

1954 Aircraft Exports Down 30% from '53

Dollar volume of U. S. aeronautical exports were 30% lower last year than in 1953, according to Aircraft Industries Association. Product exports during 1954 were worth $619 million against $880 million the previous year.

What airline made courtesy a career?

It's United Air Lines where stewardess service began!

A girl named Patricia, age 11, wrote us recently: "I've wanted to be a United Air Lines stewardess since I was 6 years old."

From 11 back to 6 is a long time, but Patricia might like to know that the career she has in mind goes back beyond that. For this year marks the 25th Anniversary of stewardess service, originated by United Air Lines in May, 1930.

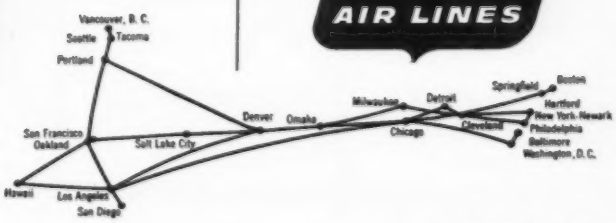
It was then that Ellen Church, the nation's first stewardess, and 7 other girls pioneered a great new career for young women. United Air Lines' idea was simply this: to make Mainliners more than airplanes—to make them "homes aloft."

Today the trim uniform of Mainliner blue has become a symbol of the finest in courtesy and hospitality. Faces change, for more than 4000 girls have carried this great tradition forward. But the *spirit of service* remains the same—and there's no other service quite like it.

And so, Patricia, we hope you *will* become a Mainliner stewardess some day! You'll be joining the "first team" in air travel.

For reservations call or write United Air Lines or an Authorized Travel Agent.

UNITED AIR LINES



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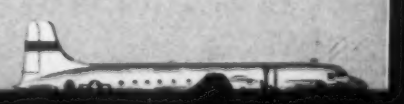

* MILITARY AIR TRANSPORT SERVICE

Airline Dividends May Hit New High in 1955

But while the trend is encouraging, cash 'pay-out' for the industry is far below the U. S. corporate average.

By SELIG ALTSCHUL

SUSTAINED by a rising earnings trend, cash dividends to be paid by the domestic trunk airlines are likely to reach a new high for 1955. Heartening as this showing may be, the fact remains that the industry, having a great need to husband its financial resources, remains relatively stingy in cash disbursements to its stockholders.

During 1954, the domestic trunks paid an aggregate of $14.3 million in cash dividends. This represented a "pay-out" of 27.8% of the industry's $51.5 million reported net income. By contrast, the average "pay-out" by all American corporations last year, as compiled by the Department of Commerce, came to 55.6%.

Similarly, for 1953, the domestic trunks averaged a 26.6% "pay-out" in disbursing $12.9 million in dividends on $48.4 million of reported earnings, compared with an average "pay-out" of 51.4% for all U. S. corporations. For 1952, domestic trunk cash dividends of $12.6 million represented a 23.6% "pay-out," compared with the U. S. corporate average of 52.9%.

• **In an exclusive** AMERICAN AVIATION projection, cash dividends (on common and preferred) for the domestic trunks are estimated at from $17.5 million to $18.5 million for 1955. Assuming that the industry's net income for the year may reach an area of from $60 to $70 million, at best, this would represent but a 29.2% dividend "pay-out" for the airlines. All present indications, on the other hand, point to a general U. S. corporation dividend "pay-out" in 1955 of at least 60%, if not higher.

Important variations from the industry average among the individual airlines have existed and will, of course, continue. The accompanying compilation reveals the per common share dividend record of the separate trunks for the immediate past three years, for 1945 and the author's estimate for 1955.

It can be seen that not all airlines have paid cash dividends and those making disbursements are by no means uniform. It also is significant that dividend payments, albeit at low levels in most instances, are leading to a record of stability for the disbursing carriers.

• **It was not until 1950** that many of the larger trunks resumed a measure of cash dividends through token payments. This was gradually stepped up until, in recent years, regular quarterly disbursements have been established for most of the carriers. This experience of recent years stands out sharply in contrast with the 1945 record, a year in which the industry was at a crest of earnings and, more importantly, at the stage of great expectations.

Throughout its long formative period, the air transport industry, constantly expanding and requiring almost continuous re-investment of earnings, was unable to pay anything but nominal dividends and this only at sporadic intervals. This was acceptable to stockholders as the airlines held their big attraction in the growth qualities of the industry. There was that hope that someday a rising earnings curve would establish a degree of financial substance.

The bulk of available earnings has been constantly "plowed back," and has greatly facilitated the acquisition of augmented properties. This made for a great degree of tolerance among airline investors. But this attitude has undergone a significant transition throughout the years.

• **The air transport group** has attracted a broader and more diversified group of investors who do not have the same patience in understanding the basis for postponing income disbursements as do the more "sophisticated" investors and speculators who first supported airline securities because of the capital gains prospects. This condition becomes particularly pronounced when a wide selection for investment prevails among broad industrial groups affording attractive prospects in earnings and dividends.

As long as capital demands in the air transport industry continue heavy, equities of the group must compete for investment consideration among other industrial situations that have many attractions of their own. For this reason, the airlines are faced with the necessity of providing a larger measure of income return than has prevailed in the past, if improved investment stature is to be attained.

Accordingly, there has been a strong compulsion for major trunks to go on a regular quarterly cash dividend basis. Stockholders, by receiving four tangible manifestations during the year of the carrier's progress, develop a warmer regard for management. Moreover, the financial community, including investment trusts and other fiduciaries are likely to become more favorably impressed and make commitments in equities with improving earnings and dividend records.

• **Airline managements** have been quick to recognize this condition. National Airlines, for example, recently

(*Continued on Page* 39)

AIRLINE CASH DIVIDENDS

(Per Common Share)

Actual And Forecast

	Calendar Years				
	1955#	1954	1953	1952	1945
American	$0.80	$0.60	$0.50	$0.50	$0.20
Braniff	0.45	0.50	None	None	0.60
Capital	S	(A)	None	None	0.25
Colonial	None	None	None	None	None
Continental	0.50	0.50	0.50	0.50	0.15
Delta	1.20	1.20	1.10	1.00	0.50
Eastern	1.00	0.50	0.50	0.50	0.25
National	0.80	0.60	0.55	0.50	None
Northeast	None	None	None	None	None
Northwest	0.40	None	None	None	0.50
TWA	S	None	(B)	None	None
United	1.50	1.50	1.50	1.50	0.50
Western	0.60	0.60	0.60	0.60	None

NOTES: *# Author's minimum estimates for year.*
(A) Paid 5% in stock, December 1954.
(B) Paid 10% in stock, January 1953.
S Stock dividends of from 5% to 10% estimated.

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Further savings in delivery time and reduced inventory are available through this new Thompson plant. Now, in New York too, you can be assured of the same safe, dependable and economical retreads that have been identified with our Miami and San Francisco plants for many, many years . . . Thompson *Extra-Landings* Retreads or Top-Caps.

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ROLLS-ROYCE DART

propeller turbine engines

FOR SPEED AND RELIABILITY

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Judge a Product by its Users

In developing its versatile reconnaissance bomber, the RB-66, Douglas utilized a wide range of Aeroquip products and engineering services. The plumbing systems include Aeroquip weight-saving hose lines and, of particular note, rigid tubing assemblies made to precise specifications by Aeroquip.

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BRITISH EUROPEAN AIRWAYS REPORTS:

Each Viscount produces $100,000 net profit a year

Wherever the Viscount flies...traffic figures rise!

The profit-making capacity of the Vickers Viscounts flying for BEA demonstrates the truth of this maxim every day of the year. And every other enterprising airline that has added Vickers Viscounts to its fleet has similar success stories to relate. Air France: traffic up 25% to 30%. Trans-Canada Air Lines: traffic up 55%. Aer Lingus: traffic up 26%.

The only turbo-prop airliner in service in the world, the Vickers Viscount has established itself as the most *adaptable* aircraft of our times. Whatever the climate —tropic, temperate or arctic—whatever the size or competitive problems of the airline for which it flies, the Viscount delivers the same gratifying results. Traffic and load factors rise, operating costs are lowered and profits increase.

The Viscount's popularity with passengers is based on advantages they can immediately see, feel and enjoy. It has reduced flight times by as much as 30%. Virtually free from vibration, the Viscount creates a new dimension in travel comfort. Behind the new Viscount stand the great name and service organization of the Vickers Group—internationally famous as makers of ships, industrial machinery, heavy tractors and precision equipment.

Capital Airlines will put Viscounts into service between Chicago, Pittsburgh, Washington and Norfolk in July.

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United States Representative: Christopher Clarkson, 10 Rockefeller Plaza, New York 20, N. Y.

(*Continued from Page* 34)

voted a quarterly dividend of 25 cents a share payable July 21. The company previously paid 15 cents a share quarterly.

American Airlines, which paid but 25 cents per common share in 1950, paid 50 cents per common share annually in 1951 through 1953, going on a 15-cent quarterly basis for 1954. However, early this year, American increased its quarterly dividend rate to 20 cents per common share.

Eastern, which paid a nominal 50 cents per share in each of the past four years, has moved to a 25-cent quarterly basis for 1955.

After a lapse since 1946, Northwest resumed a dividend on its common, paying 20 cents per share on May 1, 1955.

Braniff, too, rejoined the dividend payers by disbursing 50 cents per share in December 1954, after its December 1951 payment. Another interim payment, 15 cents per share, was made by Braniff on April 28, 1955.

Colonial and Northeast (common only) remain with the dubious distinction of not having paid any cash dividends during their entire corporate existence.

Capital Airlines paid a 5% stock dividend in December 1954, and by sharply building-up asset values more than offset lack of past cash disbursements.

United Airlines has the most liberal dividend "pay-out" record among the domestic carriers. For example, during 1954 it paid out 42.6% of its earnings to its common stockholders and 45.7% in 1953.

All dividends due on the preferred stock issues outstanding and issued by American, Northwest and United are being paid when due. In fact, with the exception of the preference stock of Northwest, which ultimately made good all payments due, the dividends on the senior equity issues of these carriers have been paid on schedule from their inception, even during periods of adverse earnings. This has made for a good credit record.

• **While self-generation** of funds through depreciation cash throw-offs, for most carriers, have reached formidable proportions, it is a mistake to assume that this will find immediate reflection in larger cash dividends. Such funds are vitally needed to retire debt incurred to finance the recent wave of equipment expansion and to bolster the capital base of the industry to prepare for subsequent acquisitions of turboprop and jet transports in the years ahead.

The rising earnings and dividend curve among the airlines is an encouraging trend, but is not likely to mean sharp increases in cash disbursements to shareholders in the forseeable future.

For a broader perspective and to highlight relative development in capital structures and scope of operations, it is interesting to compare the dividend paying status of American Airlines and that of the New York Central Railroad. American, which paid more in aggregate dividends last year than any other airline ($5.3 million) and is expected to do the same for 1955 by disbursing an estimated $6.9 million, will fall far short of the $12.9 million in dividends projected for New York Central stockholders.

American (and United, too) exceeded the New York Central in revenue passenger-miles last year and will do so again this year but have some distance to go to equal the railroad's current cash dividend disbursements. • • •

CESSNA CH-1 all-metal helicopter has been certificated by CAA. Company says the copter can hover at 11,000 ft. with a maximum gross weight of 3,000 lbs., and has a top speed in excess of 120 mph. The CH-1 is powered by a 260 hp Continental FSO-470-A engine.

another aircraft problem solved by **Harley**

When Beech aircraft corporation needed a Tow Target Release for a group of their Beechcraft Model 18s, Harley Patents Special Design Division came up with the answer.

Harley Tow Target Release

Release Handle

The Harley Tow Target Release, (illustrated above) weighing less than one pound and offering 7500 pounds of tensile strength is just one example of Harley Patents' creative design skills.

Harley Patents' Special Service Division is prepared to use its resources and facilities to solve any problem where minimum weight and size coupled with maximum tensile strength is required.

For a solution to your special problem contact your local Harley representative or write directly to New York office.

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Proven in Operation to Offer . . .

MAJOR FUEL ECONOMIES • INCREASED POWER OUTPUT

Simmonds Aerocessories, Inc., manufactures the only advanced type fuel injection system now in production in the U.S. for reciprocating engines up to 600 h.p. After extensive field tests on U.S. ordnance engines (where fuel economies of more than 20% were proven) SU Fuel Injection Systems are also being specified on a growing list of medium-range aircraft and helicopter engines.

Other proven advantages of the SU Fuel Injection System:

- **Overcomes major icing problems; gives improved cold starts.**
- **Eliminates the need of hot-spots and pre-heaters; simplifies manifold ducting.**
- **Provides increased power output due to removal of intake obstructions.**
- **Provides improved fuel distribution and better cylinder head cooling.**
- **Operation not affected by engine attitude.**

Complete data on SU Fuel Injection Systems available on request.

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Bristol Orpheus Light Turbojet Carries No Fat

• Simplicity and ruggedness are fundamental features. Accessories are kept to a minimum.

DETAILS of the Bristol BE26 Orpheus light turbojet, open secrets in NATO circles the past year, were revealed publicly for the first time at last month's Paris Air Show.

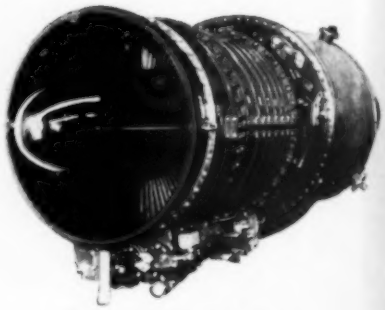
This simple axial unit, in which the U. S. has financial interest, is the first design completed for The Bristol Aeroplane Co. by Dr. Stanley Hooker, who originated the Avon for Rolls-Royce. The engine has been an all-out effort by Bristol, with Hooker driving his team to the limit to get the engine on the bench by the end of 1954, one year after starting the design.

Originally a private venture financed entirely by Bristol, the British government agreed to sponsor the Orpheus when its first bench runs proved outstandingly successful.

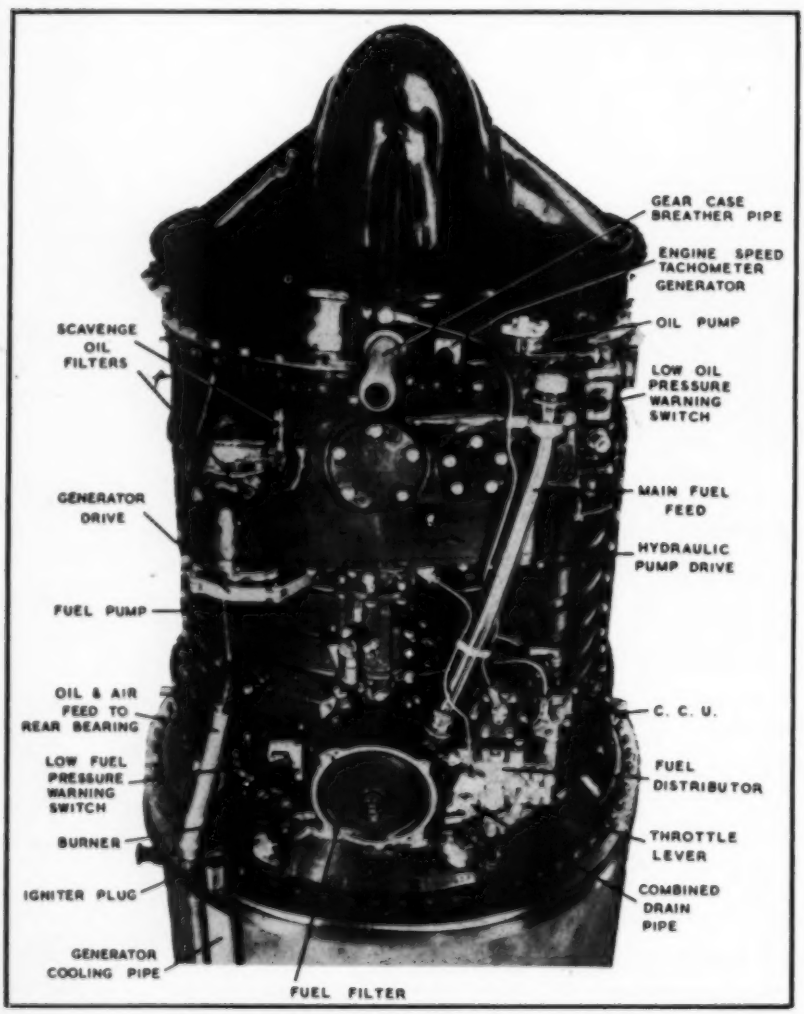
• **As a private venture,** the Orpheus was hawked around Europe by Bristol sales representatives as the best powerplant for the NATO light attack airplane requirement. Principal details were widely disseminated, but this did not prevent the British Ministry of Supply from attempting a belated security clamp once the engine became a government-sponsored project.

The following staff analysis brings AMERICAN AVIATION readers up to date with information so far available only in NATO quarters.

Fundamental features of Hooker's design are simplicity and ruggedness, so as to get a high power/weight ratio in a practical, easy-to-maintain unit. Initially tailored to W.E.W. Petter's requirements for the Folland Gnat lightfighter, the Orpheus carries no fat: all but the essentials for a lightfighter have been dropped. For instance, accessories are kept to a minimum. There is no anti-icing, and compressor air bleed is used for cockpit pressurization.



Three-quarter view of Orpheus.



Belly view of Orpheus. (CCU=combustion control unit)

Design Features

To get simplicity, a two-bearing rotor is used with a stressed outer casing. Evidence of rigid design can be seen in the four front and eight rear bearing support vanes. Front bearing is ball type, taking thrust, and the rear bearing has roller races to make it less vulnerable to heat.

The seven-stage axial compressor is the same as the front compressor of the BE25 turboprop. It is of simple design with a front row of fixed entry guide vanes.

• **Hooker has evolved** a simple method of attaching the compressor stages and when the Orpheus was first run, the front stage was removed. This allowed the engine to turn at full rpm while reducing loads on the hot-end components and the thrust bearing. After a satisfactory first strip, the front stage was added and the full test program started—and continued so successfully that hours now are nearing 2,000 on the first half-dozen engines.

Implication of "button-on" compressor stages is more power later, since an *extra* O-stage can be added. In fact, spacing of the front end of the compressor casing suggests just that.

Combustion chamber is the Bristol cannular type—that is, an annular casing containing seven individual flame tubes. Casing is welded nickel-alloy sheet in one piece, attached by about 60

the world's shortest runway

In the event of surprise attack with today's weapons, a single bomb could wipe out a whole area. Meanwhile, longer and heavier runways are essential to the operation of today's aircraft.

Because of this, the Air Force has long been concerned with the need for entirely new ways of getting its fighter planes into the air by means which would eliminate the concentration of aircraft in the vulnerable areas of forward bases.

Martin engineers, working with the Air Research and Development Command, were given the job of finding a solution to this important problem—and shown here is their answer.

It is the world's shortest airstrip—a mobile zero-length launcher which is transportable by air or land and which operates in a space of only ten square yards. It is shown here blasting a piloted Republic F-84 into full flight without the necessity of any take-off run.

As an outgrowth of the work of the same Martin-ARDC team which produced the TM-61 Matador pilotless bomber and zero-length launcher, this important development is another example of Martin's contribution to American airpower and security.

MARTIN

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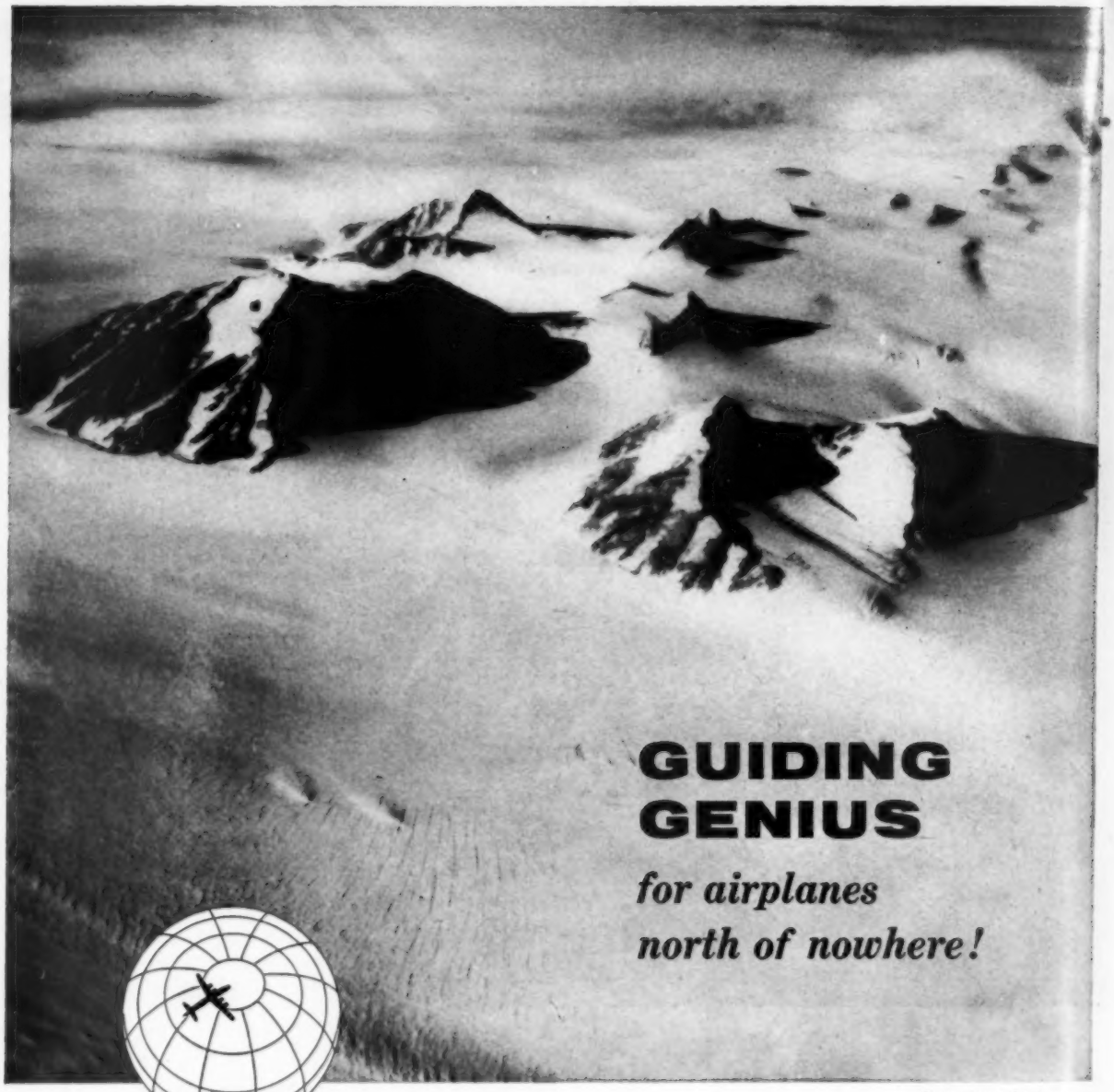

Photo: Philip Gendreau

In all the geography of the skies, no long-range aircraft need ever again lose its way . . . even if earth and stars zero out, and the radio beam has said good-bye . . . even if the plane flies hundreds of miles off course to evade sudden storm or interception.

A new navigation device, with a cybernetic brain and a "take-it-or-leave-it" attitude to the magnetic pole, tells crew members exactly where in the world they are at any instant of the flight.

Developed by General Precision Laboratory in cooperation with the Air Force, this complex electronic-mechanical device keeps a minute by minute diary of the plane's speed – in cruising, descent or climb . . . records faithfully every shift in course direction . . . notes each change in wind velocity . . . and then displays aircraft position continuously from instantaneous calculations.

To the nation, this GPL development means even stronger air defenses, aided by a guiding genius that reads global skies like an open book.

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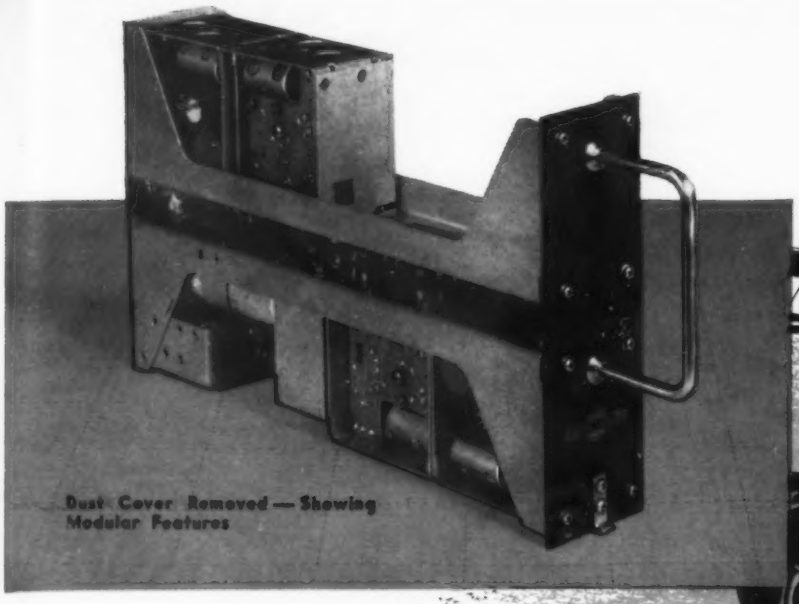

Dust Cover Removed — Showing Modular Features

A New Concept

in an Airborne Interphone and Isolation Amplifier

Collins announces the latest design in an Airborne Interphone and Isolation Amplifier. Printed wiring, transistors, and unitized construction are combined in a light-weight ¼ ATR package to provide the 346A-1 with one Interphone and three Isolation Amplifiers.

For maximum reliability, only eighteen electrical components are used in each of the four identical amplifiers. The chassis contains microphone circuitry, facilities for mounting two additional amplifiers (four normally supplied) and a compact line noise filter.

Either one or two of the six available amplifiers may be used for interphone circuits, the remaining serving as Isolation Amplifiers.

SPECIFICATIONS:

ELECTRICAL: Output — 150 milliwatts per amplifier

Power Requirement — 27.5 volts DC at .420 amperes

Designed to meet ARINC Specification No. 403

TYPE OF SERVICE: Continuous, unattended

VENTILATION: Convection

FEATURES:

Transistor amplifiers
Printed wiring
Line noise filter
No internal power supply
150 mw output per amplifier
12 watts power input
¼ ATR x 12-9/16" long
Only 6½ lbs.

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COLLINS

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bolts to the intermediate firewall and diffuser flange. A single-stage turbine is mounted inside the rear of the combustion chamber, without a separate casing.

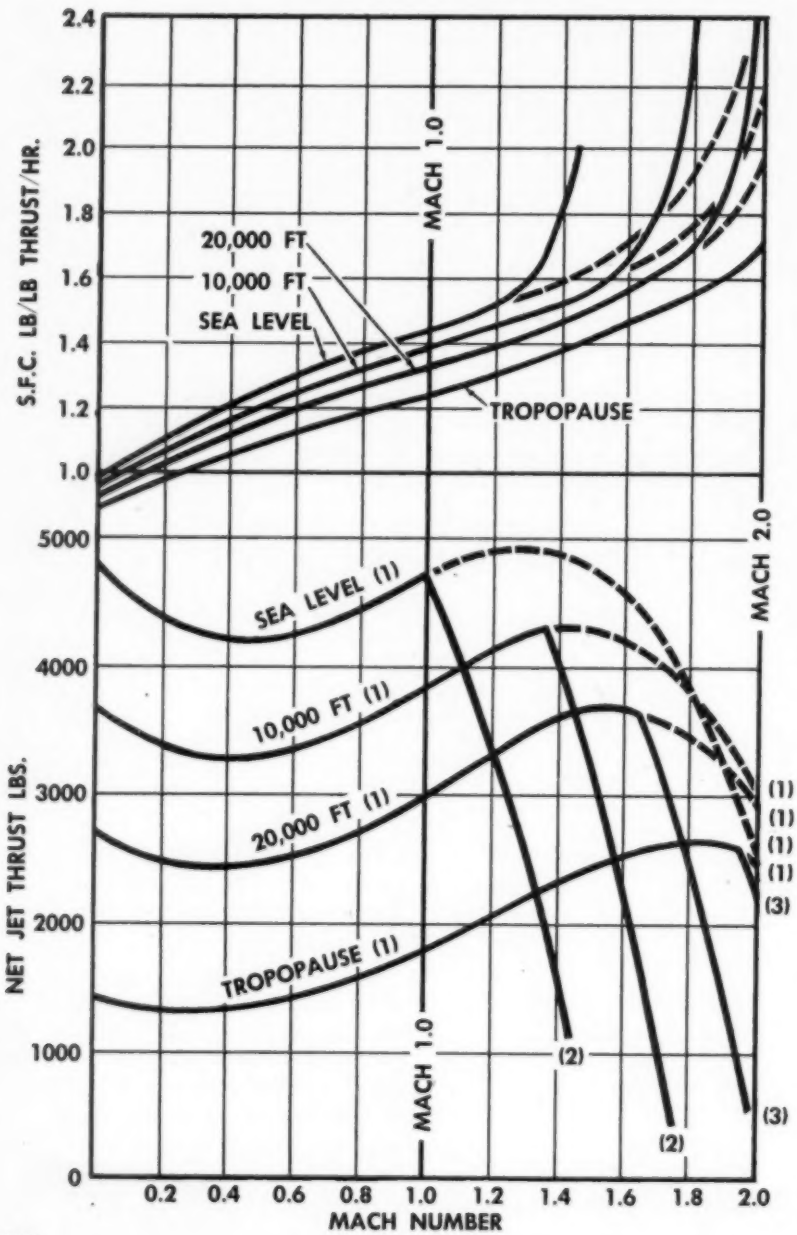
Installation Angles

To meet needs of fighter operation, the Orpheus is simple and easy to install. Main fix is by a pair of trunnions on the diffuser casing four inches ahead of the cg, plus front support brackets on the compressor casing.

A 21-inch diameter jet pipe with a 16⅔-inch nozzle is recommended. Optimum jet pipe length is four feet; minimum, one foot from attachment flange. Extra-long jet pipe does not result in much friction loss. As an example, a 10-foot pipe only reduces thrust by .3%, or less than 15 lbs. at takeoff.

BRISTOL ORPHEUS PERFORMANCE LIMITATIONS

International Standard Atmosphere



KEY:

Mach #0-1.0 no intake loss; Mach #1.0-2.0 two-shock loss.
Limitations: Compressor r.p.m. (1) or compressor delivery pressure (2) or compressor delivery temperature. Significance of Mach 1.0-2.0 curves lies in use of multiple groups of Orpheus for new supersonic fighter projects.

Either an air turbine or a gas cartridge starter can be mounted in the intake bullet. The air starter, which has a connection for external supply on the compressor casing, has a maximum light-up time of 10 seconds, using 10 pounds of air at 250 psi. The cartridge system has a single-shot remote breech mounted at any convenient point.

• **Engine control** is simplified to a single-lever unit. A Lucas B variable-delivery pump feeds seven duplex spray nozzles through a combustion control unit consisting of a barometric pressure control, throttle valve and high-pressure fuel shut-off cock.

With a two-bearing rotor, the oil system is simple and is supplied from a 1¼-gallon tank on top of the compressor casing by a pump under the front end. The fuel supply area is isolated from the combustion area by an oval firewall.

A vertical drive shaft from the front end of the compressor passes down through the lowest entry vane to a gear assembly under the engine. From this, separate drives are taken for the fuel and oil pumps, Lockheed Mark 7 hydraulic pump and a high-speed Rotax 3-kw generator. Two tapping points on the diffuser casing are available for cabin pressurization supply.

Performance

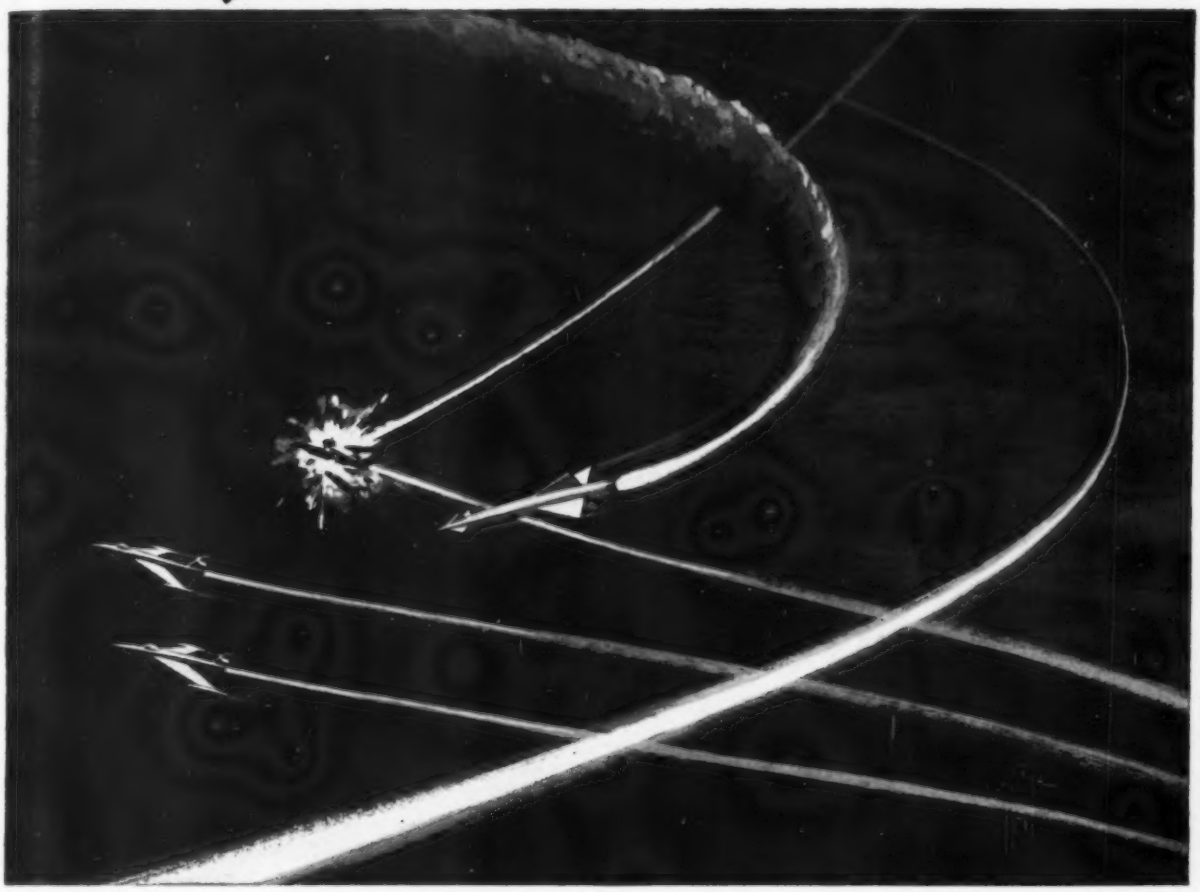
Maximum (estimated) performance and consumption curves are shown in the accompanying graph for sea level, 10,000 feet, 20,000 feet and the tropopause, above which thrust varies directly as the ambient pressure for any given rpm, while specific consumption remains constant.

Progress with bench-testing the Orpheus has been rapid. In four months 1,500 hours were run. A 50-hour flight clearance test and the 150-hour MoS type test were completed at the initial rating of 3,250 lbs. takeoff thrust. By June, extensive running at 4,250 lbs., or 87½% of maximum, had been completed.

• **Success of initial trials,** plus advent of lower power turbojets in France, led Bristol to project a de-rated engine for jet trainers. This version will be in a similar power group to the SNECMA Vesta and the Hispano-Suiza R 800. Lower stresses on this version allow reduction of weight by 70 lbs.

Important performance feature of the Orpheus is its moderate compression ratio. This makes the engine virtually surge-free and very flexible. However, although the pressure ratio is not so low that it spoils the fuel consumption, it does limit practical operation to perhaps 50,000 feet. • • •

Today and Tomorrow...



CANADAIR COUNTS — *in Guided Missiles*

Grim herald of the push-button war, the guided missile's development has become an urgent matter for all world powers. The missile itself is not enough . . . the race is now for sharper control, greater speed, higher altitudes, more sensitive response.

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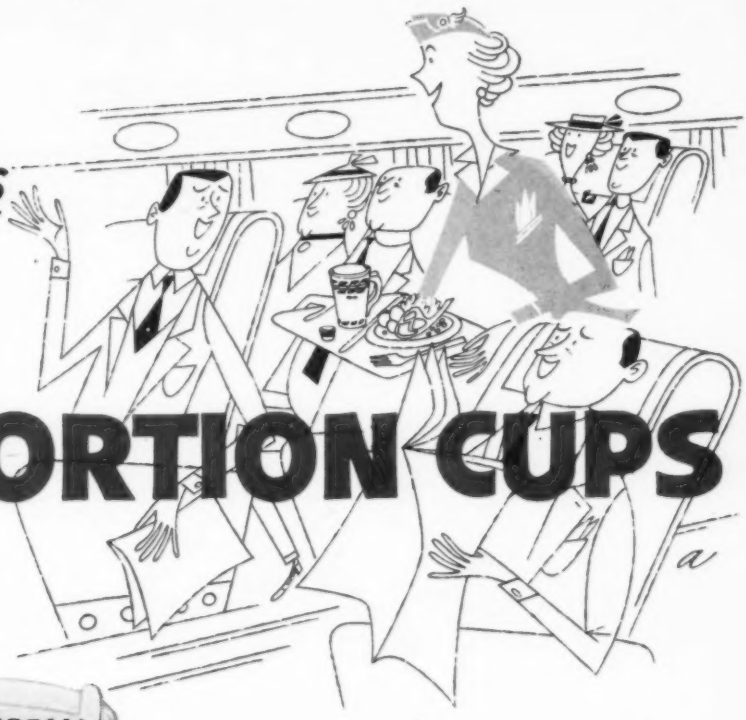

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Aviation and TV Clash Over Use of Airspace

By HENRY P. STEIER

Aviation and television broadcasting have expanded rapidly into the same airspace until a squeeze has been created that must be resolved.

There are two primary issues: What hazards to air navigation are posed by tall television transmitting antenna towers, and what limitations are likely to be imposed upon TV expansion to smaller communities because of tower height limitations.

• **Lacking a satisfactory** federal policy on the hazard issue, some states are attempting to control tower heights. North Dakota has passed a law requiring a filed notice of intention to build a structure 200 feet above ground level. California and Wisconsin are working on legislation.

Reported in the press and AMERICAN AVIATION (July 4, 1955) was the ruling of a federal judge that a particular community statute prohibiting flying under 1,000 feet above was "null and void." The judge said the claim of the ancient doctrine "that he who owns the land owns the air above" is no longer valid. "Airspace, he said, is part of the public domain.

• **Close to the "grass roots"** is the issue of economic necessity that forces small community broadcasters to erect high towers to increase TV's radius of coverage and gain a greater service area. The average investment of $500,000 in a TV facility and the high operating costs can only be supported in rural areas by offering advertisers the largest possible population coverage.

• **On the Washington front,** the Air Coordinating Committee announced last March the organization of an Industry/Government Tall Structures Committee to identify and study the issues involved in the joint use of airspace.

Composed of technical, economic and legal representatives from various government agencies concerned with the problems of hazards to air navigation created by high structures, aviation and broadcasting working groups were formed within the Committee to prepare reports on the problem.

A third working group is now reported to be putting the viewpoints together, but has found them so incompatible that little hope is held for a spirit of co-operation.

• **Close attention** is being given by aviation and broadcasting interests to three tall-towers cases pending before the Federal Communications Commission. Statutory authority to determine ultimately whether the TV towers present a reasonable possibility of a menace to air navigation is vested in the FCC under its authority to issue licenses in the public interest, convenience and necessity.

Recently, three broadcasters requested permission of the FCC to modify existing TV facilities. Each called for erection of a high tower. Two of them would be the tallest man-made structures in the world, 1,610 and 1,863 feet above ground level. The sites, near Enid, Okla., Roswell, N. M., and Selma, Ala., are near military or civil airports.

In accordance with FCC rules concerning towers more than 500 feet tall, the applications were submitted to ACC's Airspace Subcommittee (ASP) for technical study regarding aeronautical matters. ASP could not reach agreement on any of the cases. CAB and CAA approved. Air Force, Army and Navy disapproved. FCC, although a voting member, abstained from voting as a policy matter.

• **ASP military members** objected that the towers in the Enid and Roswell cases would be a "real and mental hazard" to civil and military aircraft. In the Selma case, they found the tower would be an unacceptable hazard due to "excessive height."

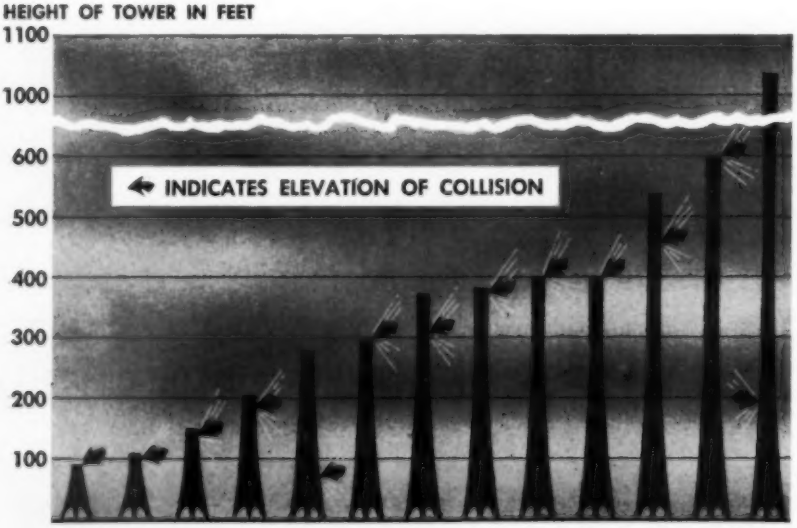
CAA and CAB found nothing in the proposed heights and locations that would create a hazard under existing flight rules and procedures.

The application filed by Enid's KGEO-TV asked for authorization to relocate their present 816-foot antenna at a point between Enid and Oklahoma City to eliminate "ghosting" caused by the orientation of most of Enid's receiver antennas towards Oklahoma City.

The new site would put the antenna farther from Enid's Woodring airport and Vance AFB, but would require raising the height to 1,356 feet for adequate coverage. According to KGEO-TV officials, the commander of

USAF Medical Safety Division data on pilot and aircraft reaction time presented as data on tower hazards.

0.1	second—Eye image to brain
1	second—Recognition time of brain
5	seconds—Time to make decision
0.4	second—Decision time to muscle
0.4	second—Time for muscle to react
5	seconds—Air reaction lag
11.9	total time to see object and move aircraft
10.4	time in seconds for aircraft at 300 knots to travel 1 mile
—1.5	seconds too late to avoid collision



Aircraft collisions with towers or guy wires from 1950 to 1953.

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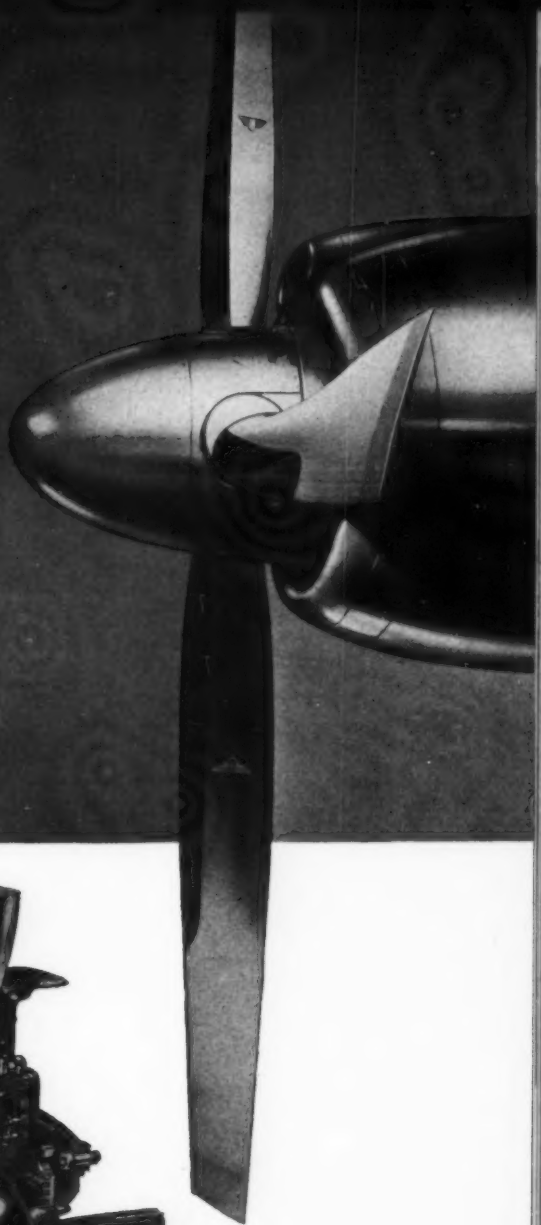

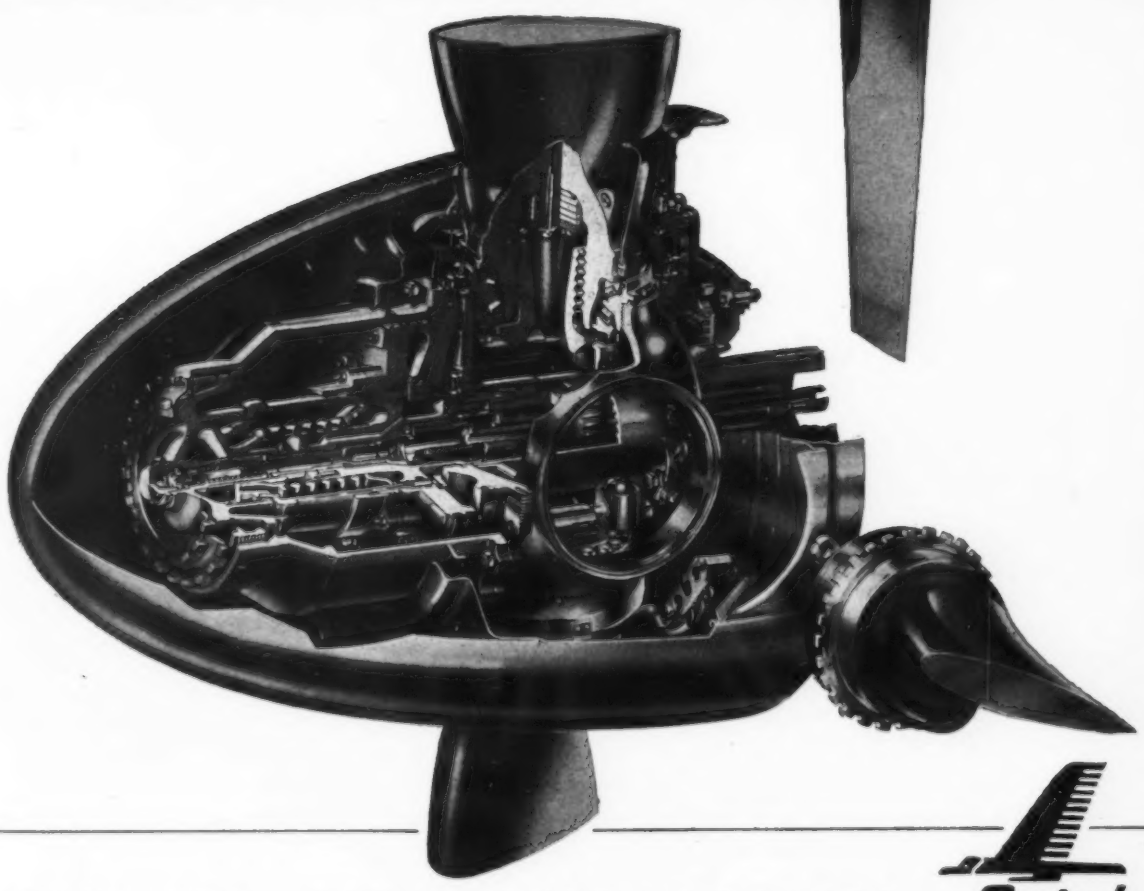

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Vance AFB and Central Airline's manager at Woodring said the new site would be a "lesser hazard" than the present one.

• **After ASP's failure** to agree on the Enid tower, the Department of Defense, Air Transport Association and Aircraft Owners and Pilots Association intervened in the FCC proceedings, as did a member of Congress, Victor Wickersham (D-Okla.), and member of Armed Services Committee.

In a series of letters exchanged between Wickersham and Air Force Secretary Talbott, the congressman wrote, ". . . the problem is that the Air Force, Army and Navy desire to wait until a policy has been set by a joint Industry/Government Committee," and, "the ACC is, I am told, of the opinion that until said Industry/Government Committee issues its report, that said Airspace Committee is deciding each case put before it on its own merit and individual basis. I am convinced this case did not receive such consideration."

He also told Talbott that communication benefiting the lives of 400,000 people was at stake, an investment was jeopardized, and "television in its current and future state is a valuable defense aid."

• **Talbott replied,** "Any structure 2½ times as high as the Washington Monument is a real and mental hazard to pilots," that the application had been given careful consideration, that the "tower protrudes into airspace now expected to be utilized by aircraft for navigation," and that "although CAA and CAB concurred with the proposal, the representatives speaking for the largest segment of aeronautical operations did not concur."

In response, Wickersham said, "The most disturbing note in the letter you signed is the admission that the Secretaries of the other military services join in their choice of the greater hazard. This is a patent admission that the Department of Defense uses but one mind (in conspiratorial fashion) to vote three times on the Airspace Committee. What interest does the Navy and Army actually have in this flat strip in Oklahoma?"

Finally, Talbott's office advised Wickersham by telephone that his request would have been granted except for the fact the policy involved had been set by the Department of Defense.

• **Testimony** and findings of fact have been presented to the FCC examiner by Defense, engineering consultants to owners of KGEO-TV, ATA, AOPA and FCC's Broadcast Bureau.

Contending that aviation's major assets are speed, operational flexibility and point-to-point travel, Brig. Gen. R. E. Coon, USAF, witness for the Department of Defense said:

"It is anticipated that the Department of Defense will have TACAN," and "the proposed structure would preclude full utilization of airspace and limit use of the additional navigation facilities and training," and make scramble operations, low level interception, and off-airways operations more hazardous.

A study of 13 aircraft collisions with towers, made by KGEO-TV's engineering consultants, was presented to show the relationship between tower height and levels of collision. All collisions were below 500 feet, except for one at 600. Evidence, they said, showed the accidents resulted from pilot error, malfunctioning of equipment, or violation of CAA regulations.

In three cases, antenna guy wires were struck while rules of ceiling or visibility were being violated.

ATA, speaking for Central Airlines, called attention to Central's off-airways route between Enid and Oklahome City flown by visual flight rules for which the minimum altitude is 2,300 feet above sea level and to the DC-3's restricted performance during winter icing conditions and summer thunderstorms when lowest altitudes are desirable. The proposed tower would increase the minimum to 3,500 feet, or increase flight mileage between Enid and Oklahoma, according to ATA.

AOPA "objects" to any structure more than 500 feet above ground, and believes all tower proposals for heights of above 1,000 feet should be deferred "until safety considerations pending before various government agencies have been resolved."

FCC's Broadcast Bureau says a grant of permission to build the tower would be in conformity with past FCC action and not inconsistent with any of the express provisions of present rules and regulations of CAA, Air Force, Army, or Navy, and is not a menace.

• **In Roswell, N. M.,** KSWS-TV has a 790-foot tower to which Air Force officials at nearby Walker AFB objected because the tower is 10 miles from the end of an instrument approach runway and in direct line with it.

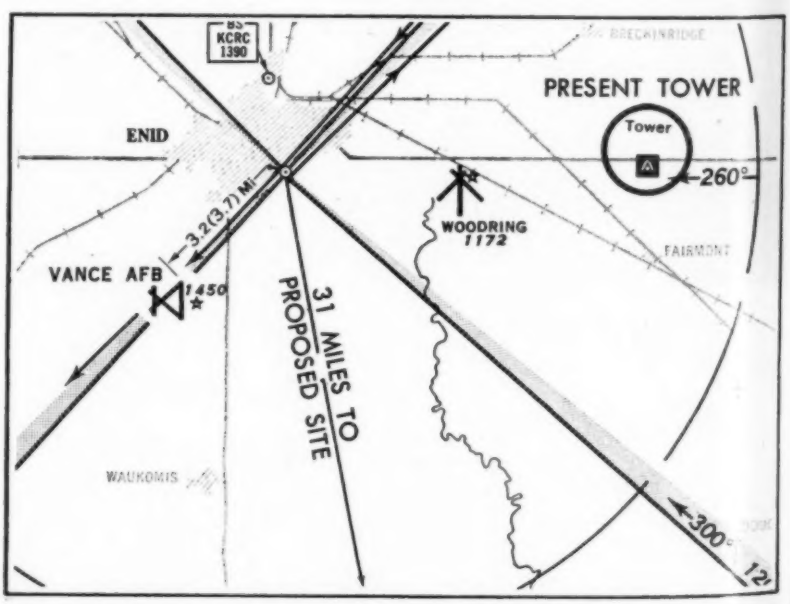
The owner agreed to move the tower to a point 43 miles east of Roswell, and the Strategic Air Command agreed to pay half the cost, $12,000, for moving the tower, despite the fact the move would cost an additional $58,000 for equipment.

However, the new site would require an antenna 1,610 feet above ground to place the FCC required signal strength into the KSWS-TV service area. Both the Los Angeles Regional Airspace Subcommittee and SAC approved the move. Washington's ASP disapproved.

ATA, on behalf of Continental Airlines, called attention to Continental's two daily flights from Roswell to Lubbock under VFR conditions, although it was admitted that without pilot error, equipment failure or violation of rules, the tower would not be struck and that either tower might be struck under those conditions.

Defense Department and AOPA offered the same objections as in the Enid case.

• **Last month,** FCC ordered the application of KSWS-TV granted, unless an appeal to the Commission is taken.



Portion of Enid, Okla. Instrument Approach Chart showing TV tower sites.

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The examiner, in conclusion, said ". . . if the term 'menace' is so broadly defined as to include any structure . . . where there is a possibility, however remote, that it may be struck by an aircraft" any structure may constitute a menace.

"In fact," he said, "any man-made structure or natural obstacle such as a mountain or a tree, or indeed even the earth, may constitute a menace to air navigation under certain circumstances and conditions . . ."

The examiner answered the question in issue about "reasonable possibility of the tower height and location being a menace to air navigation":

"Indeed, if this Commission were to be persuaded solely on the basis of such generalized objections . . . the practical result would be to require it to bar arbitrarily the erection of all future radio and television towers of any appreciable height . . . "

• **The Selma, Ala. case,** still in its early stages, is composed of the hazard issue, and accusations by Montgomery, Ala., TV interests that WBAM-TV, the applicant, is attempting "city straddling" by its request for relocation and construction of a tower 1,863 feet above ground.

Again, the Regional Airspace Subcommittee approved the tower, while the Defense claims operations from Maxwell and other nearby AF Bases would be menaced.

Feeling runs high, and observations from informed observers range from suggestions that the issues be taken out of aviation and broadcasting hands and given to a judicial body, to suggestions that the matter be given to the Department of the Interior.

In any event, it looks as if Defense members on ASP no longer participate as experts, but have been ordered to adopt a fixed policy on towers more than 1,000 feet high, irrespective of specific aircraft operations and general public interest appertaining to each case.

• • •

SAGE: AF System for Traffic Control?

Air Defense of the United States, and perhaps civil air traffic control, may be aided within a few years by a proposed military system of air defense communications. Introduction of newly developed electronic equipment is expected to give the Air Force advanced techniques and improved capacity for deployment of aircraft in intercepting attacking forces.

Witnesses at the Senate hearings on the Department of Defense appropriations for 1956 discussed $2 billion the Air Force says it needs for implementing our Air defense system. The money is to cover contracts and engineering for leased commercial communications facilities operated by American Telephone and Telegraph Co. The leased services are for SAGE, which Air Force defines as a "semi-automatic ground environment system."

It was described to the Senate Subcommittee as a ground circuit system that feeds information, picked-up by a radar from an *identified* plane, into a control center and back out to fighter, antiaircraft or missile units.

• **Sage will require** 25,000 circuits and will consist of a network of linked communications divided into eight sectors and 32 subsectors.

The integrated system of air traffic control specified by the Radio Technical Commission for Aeronautics Special Committee 31 in 1948 called for a common solution to military and civil traffic control requirements through integration of the target air traffic and navigation system with the air defense and early warning system.

One of the problems recognized by the SC-31 program is the need in event of a national emergency, "to clear civil aircraft out of a combat zone and to direct fighter planes into the region and control their actions." To this can now be added missile control.

MICROWAVE antenna used on the transcontinental radio-relay system for carrying telephone and TV services. Similar towers may carry air traffic control data.

The Air Force has not yet budgeted for funds to cover the communication service for project SAGE since no funds for it will be required until 1958. However, in March 1955, the Air Defense Command received authority to contract with AT&T for services to subsectors 1 and 2 of the SAGE system. The 1958 date for commencing SAGE agrees with that set by SC-31 for portions of the ATC target system.

• **Among the requirements** listed for the ATC target system is identification of all airplanes by means of airborne transponders that send altitude and identity codes to a secondary, ground radar unit that interrogates the airborne equipment.

Other requirements for the target ATC system is ground-derived information for control, closed-circuit system operation, and automatic flight planning and flow control of traffic.

Radar transponders to provide requisite ATC operation are being developed. It is rumored that TACAN airborne equipment will soon have provision for transmitting rho-theta bearing, and distance information, to ground units.

This facility would close the air-to-ground link required for closed-circuit operation. Ground radar information from primary radars can then be compared with air-derived information. This gives a check on correct operation.

SC-31 called this part of the system Traffic Data Relay Equipment, since ultimate transponder development calls for provision of display of traffic data warning the pilot when his navigational information is not reliable. Target date set by SC-31 for this "private line" transponder was 1958.

• **Two elements** of the target ATC system that seem most closely associated with SAGE are flight planning and flow

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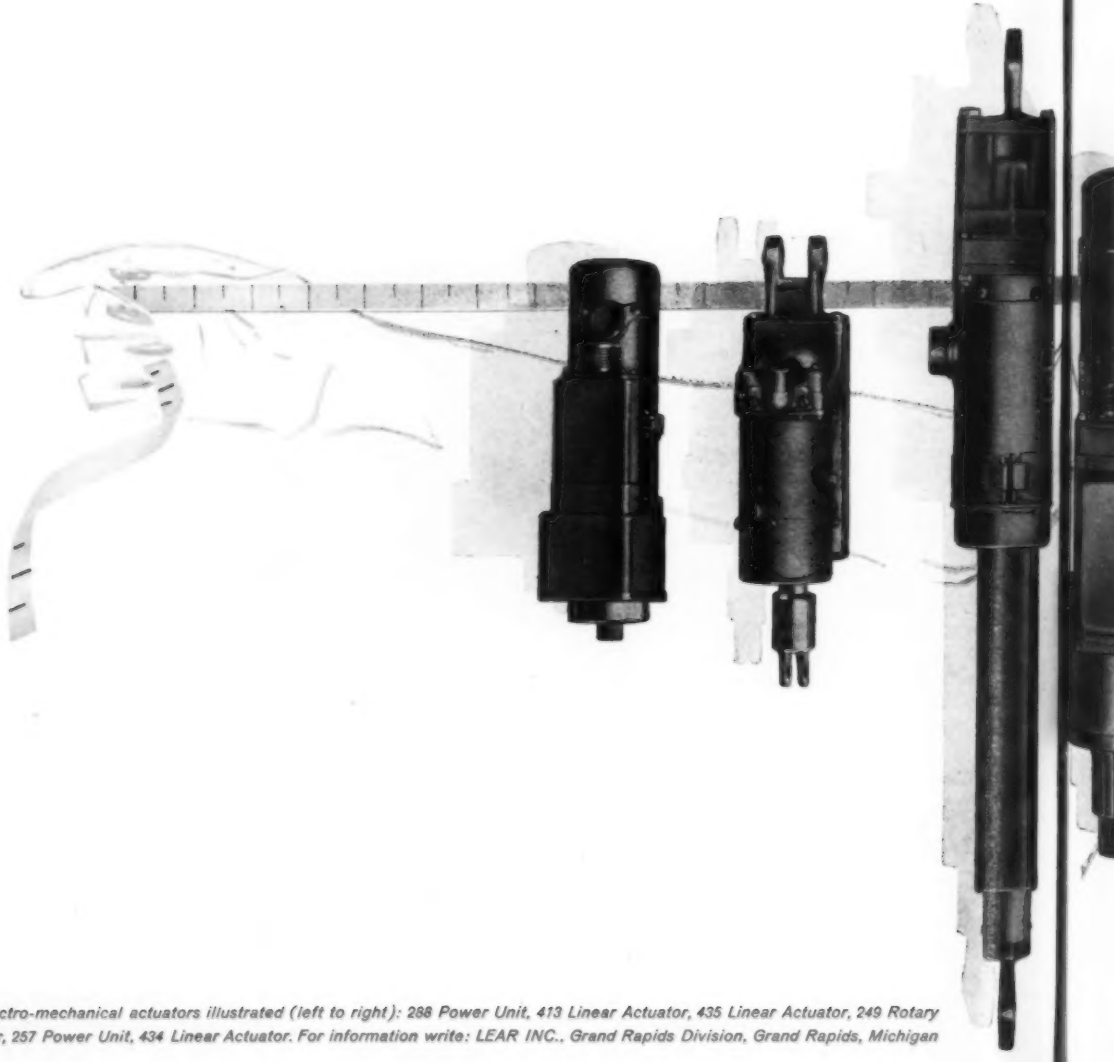

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control. According to the Senate hearing record, computer installations are part of the SAGE system. The ATC system also calls for computers to receive, store and calculate flight plan data to determine conflict between flight plans of different aircraft.

The received data would be takeoff time, speed, altitude and track. In a military installation the same equipment conceivably could also determine interception flight plans, using radar information from enemy aircraft.

Combined with the flight planning equipment in the ATC system would be flow control equipment that compares air-derived and ground-derived data and sends clearance or corrections through the "private line" equipment to the aircraft. Part of the flow control unit would be a pictorial display of the air traffic situation. The control and planning equipment would be located in general control area offices, of which 50 were proposed for the target system.

• **An important part** of any ATC system would be the AT&T radio relay links operating in the microwave region to connect the control centers. Already in large scale use from coast-to-coast, and mounted on towers carrying receiver-transmitters and super-capacity antennas, these links carry as many as 20,000 telephone circuits or 30 TV programs.

Funds for SAGE would lease the use of existing radio relay facilities, and others to be built, for the transmission of coded data between sectors and subsectors of air defense.

The National Security Council has directed the transition of air defense from a manually operated system to an automatic system. SAGE will be semi-automatic initially. • • •

Transistor News

Texas Instruments, Inc. has announced further expansion of its silicon transistor line to seven n-p-n types. The new Types 951, 952, 953 are medium-power silicon types that produce a power gain of 30db, and supply up to one watt of Class B power operating to 150C.

Silicon transistors are finding application in military airborne electronic equipment, since germanium transistors operate satisfactorily only to 65C.

Hoffman Electronics Corp. has announced purchase of all outstanding shares of National Fabricated Products, Inc., an electronic component manufacturer. National Fabricated Products owns a subsidiary, National Semiconductor Products, that has been producing silicon diodes and solar cells. Acquisition of National Fabricated Products will put Hoffman in the transistor field. They expect to add a department of semiconductor application—engineering.

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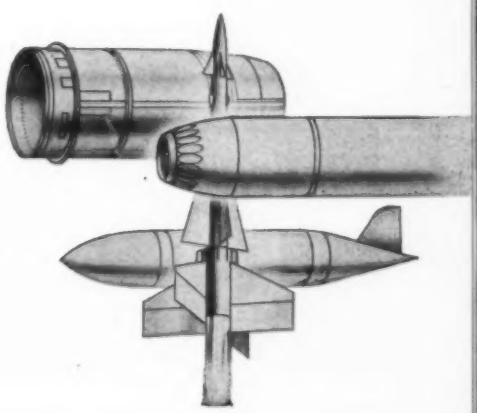

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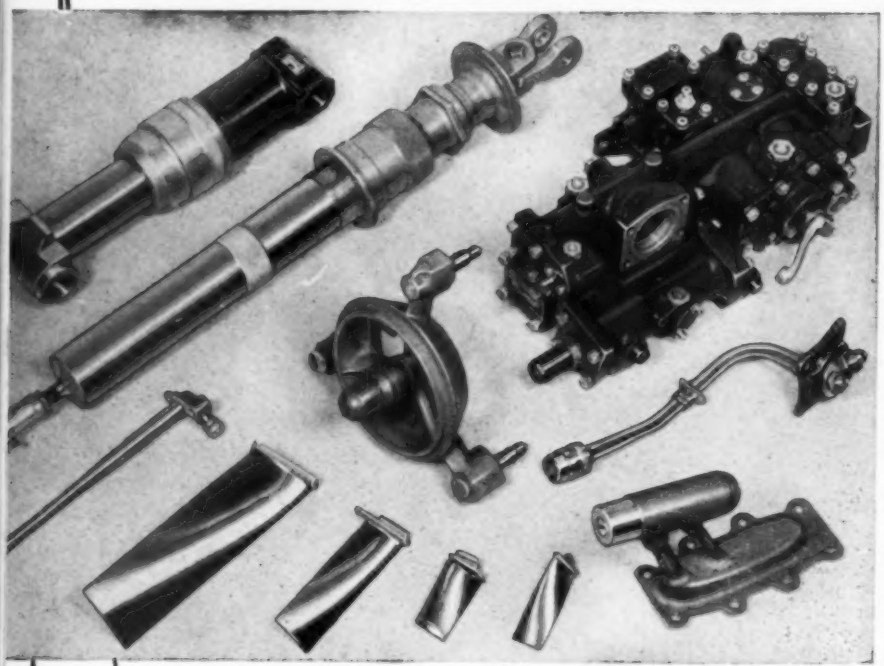

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Robert F. Spring, Pratt & Whitney Aircraft. Experimental materials control, East Hartford, Conn.

C. J. McCarthy, chairman of board Chance Vought Aircraft Inc. Other Chance Vought 25-year honorees: **Nicholas B. Antonoff, Domenic Cirigliano, Joseph J. Fiedler, Carl G. Johnson, Michael Laputz, Joseph F. Ruff, Jr., August C. Schumacher, Fred Thies, Norman H. Wright, Curt Fleischer** and **William Springob.**

JET NOISE MUFFLER developed by Rolls-Royce reportedly cuts noise level 11 to 12 decibels, or approximately in half. Silencing system uses a corrugated jet nozzle instead of the conventional convergent type. Most useful type, slated for early flight testing on a de Havilland Comet, is a 6-corrugation model of the type shown here. Design has demonstrated 12 decibel noise reduction without affecting engine thrust, R-R tests show.

He wanted to be pushed around . . .

on an AEROTHERM seat!

AEROTHERM

Model 441M-2

You couldn't convince him that Aerotherm Seats belonged only in passenger planes . . . and not on a boardwalk stroller chair. But his flight from the midwest was so enjoyable, so relaxing and comfortable that he was determined to take his Aerotherm Seat with him. Now he's the envy of everyone on the boardwalk!

Whether tall or short, light or heavy . . . your passengers will get the most pleasurable, the most comfortable ride on an Aerotherm Seat. And they'll arrive feeling refreshed and relaxed . . . ready for anything.

Aerotherm Seats are engineered and manufactured to rigid specifications. They provide maximum passenger comfort . . . are light in weight . . . and are styled to enhance the plane's interior. Yet they assure a high structural safety factor. And their adaptability of design offers a variety of seating arrangements.

Call or write The Thermix Corporation for descriptive literature today.

Offices in all principal aircraft centers.

Project Engineers **THE THERMIX CORPORATION** GREENWICH, CONN.

THERMIX CALIFORNIA, INC., 5333 Sepulveda Blvd., Culver City, California
Canadian Affiliates: T. C. CHOWN, LTD. Montreal 25 Quebec

MANUFACTURERS

THE AEROTHERM CORPORATION

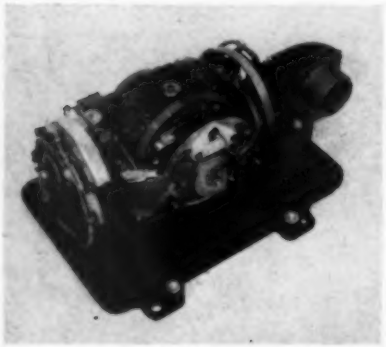
BANTAM, CONN.

Circle No. 25 on Reader Service Card.

New Products and Processes

VERTICAL GYROSCOPE

The Aeronautical Division of Minneapolis-Honeywell Regulator Co. has developed a lightweight, rugged vertical gyroscope for applications where caging is not required.



Designated the GG33 Vertical Gyro, this two-axis instrument is designed to replace earlier non-caging types. It may also be used in many autopilots, missile and platform stabilization applications where the caging feature is not required.

The GG33 weighs 4½ lbs. It is capable of withstanding up to 10 "g's" vibration at 55 cps. It is said to give the same performance and accuracy as the company's standard cageable type.

Circle No. 150 on Reader Service Card.

PANEL INSTRUMENT

A new ruggedized 1½ in. panel instrument designed for applications in aircraft, portable or other electronic equipment subject to shock, vibration or extreme temperatures has been introduced by DeJur-Amsco Corp.

Designated Model 131, the instrument is available in a wide variety of scales, ranges and specifications. Among its standard features are a watertight sealing arrangement, high flux density Alnico No. 5 magnet and a ruggedized version of the company's miniature external pivot D'Arsonval movement.

Model 131 meters meet Signal Corps specifications Mil-M-10304.

Circle No. 151 on Reader Service Card.

PRESSURE REGULATORS

A new series of air and fluid pressure regulators for use in aircraft has been announced by Clary Corp., which recently acquired the Avron Corporation. Known as the Avron line, the regulators are of three types: absolute, gage and differential. They are available in the low pressure range of 0 to 100 psi.

Applications are for pressurizing reservoirs, compartments, anti-icing, radar wave guide channels, pneumatic and fluid control systems, etc. Designs are made to meet individual customer requirements.

Circle No. 152 on Reader Service Card.

OSCILLOGRAPH

General Electric's Instrument Dept. has announced a new general purpose oscillograph for static or dynamic testing of all types of aircraft or industrial equipment.

When combined with suitable transducers and amplifiers for the measurement of pressure, vibration, strain, flow, etc., the instrument will record up to 71 individual variables on one oscillogram. According to GE engineers, this makes it possible for users to record simultaneously the many variable factors encountered in dynamic testing of machinery.

A wide choice of galvanometers, usable up to 6,000 cps, provides flexibility of measurement.

Circle No. 154 on Reader Service Card.

SERVO ACTUATOR

Lear, Inc. is offering a high-torque, low-inertia servo actuator said to yield extreme system sensitivity and stability.

Designated Series 171, the new unit consists basically of a continuous-duty motor driving two counter-rotating magnetic powder clutches and gear reduction from the clutches to the output shaft.

Lear engineers credit the low-inertia factor to the magnetic powder clutch, which has a torque-to-inertia ratio of 440,000 rad/sec² and requires less than one watt of electric power to produce full output torque.

Circle No. 153 on Reader Service Card

AIRCRAFT MOTOR

A direct-drive fractional horsepower a.c. motor for aircraft applications, equipped with a self-energized d.c. electromagnetic brake, has been introduced by Westinghouse Electric Corp. When current to the motor is interrupted, the brake can decelerate the

HILLER DEVELOPMENTS
...designs for greater mobility

PRODUCING: Army H-23
Jet Powered YH-32

PIONEERING: New Flight Principles
Advanced Propulsion Methods

Watch Hiller pace the industry in new developments.

HILLER HELICOPTERS
PALO ALTO, CALIFORNIA

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1 piece or 1,000,000

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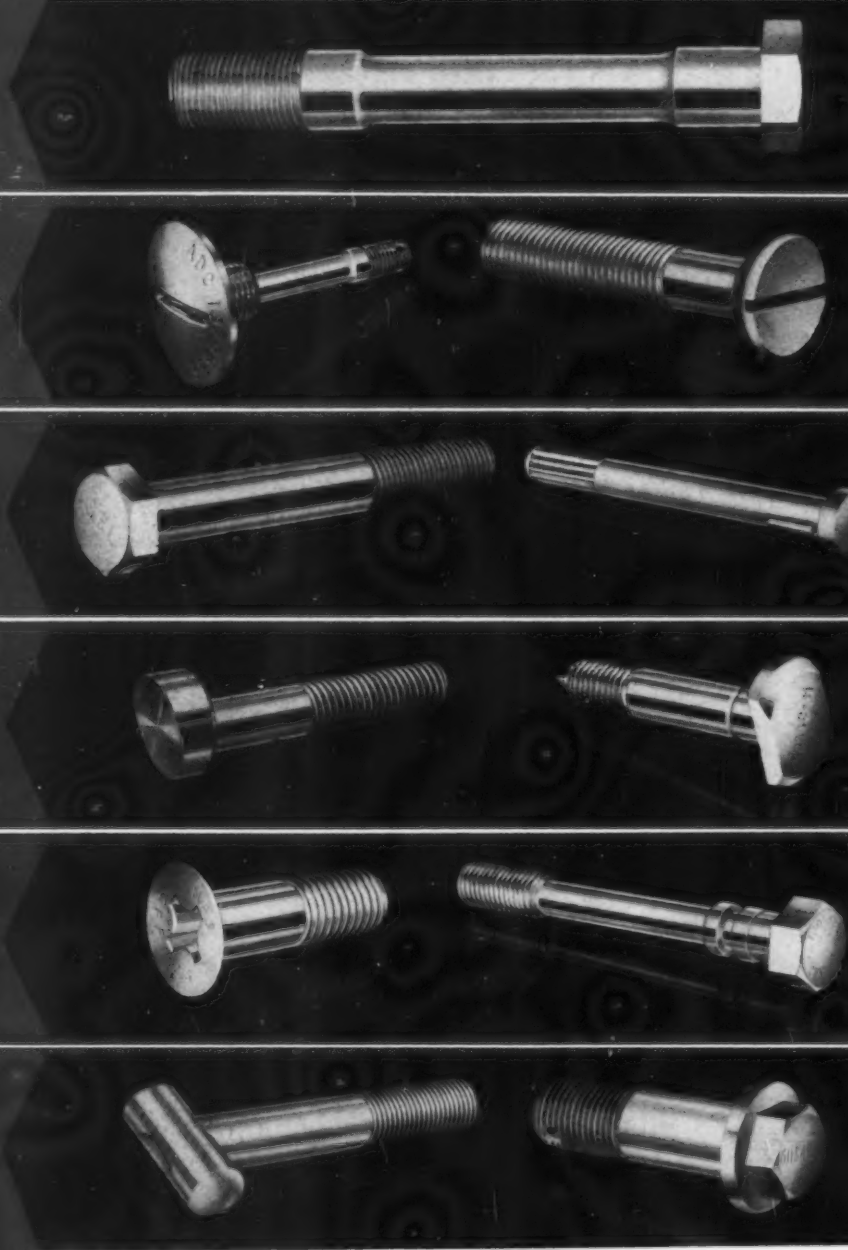
in alloys and super-alloys for engine airframe automotive and industrial uses



in sizes up to $1\frac{1}{2}$" diameter cold headed or hot forged

...of ALL configurations

For "special" service call Cooper, your MOST EXPERIENCED source of "Specials"...your LARGEST source of in-stock "Standard" fasteners – AN, NAS, and 6-Digit.

Symbol of security in fasteners

COOPER PRECISION PRODUCTS

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Person to Person

Personal contact often spells the difference between success and failure in any business undertaking. The needs for on-the-spot sales presentations . . . for executive inspection of branch facilities . . . for person-to-person consultation demand the utmost from the sales and service forces and may exceed the physical capabilities of the executive team.

Over four thousand Beechcraft Bonanzas are providing a new and better method of spanning the barriers of time and distance for forward-looking companies.

The 1955 Beechcraft Model F35 Bonanza, with its high payload, high speed, low-operating cost, and rugged dependability, enables aggressive business leaders to meet the challenge of expanding markets . . . multiplies the opportunities for personal sales and service.

A cruising speed of 184 miles per hour and a range up to 1180 miles prove the Bonanza the leader in the four-place field. It pays dividends . . . brings more time for business – more time for pleasure, too! The World Is Small When You Fly A BEECHCRAFT.

Beechcraft

★ASK ABOUT BEECHCRAFT'S NEW EXCLUSIVE LEASING PLAN.

Beech Aircraft Corporation, Wichita, Kansas, U. S. A.

BEECHCRAFTS ARE THE AIR FLEET OF AMERICAN BUSINESS

motor from 11,300 rpm to rest in less than one-fifth of a second.

Fan-cooled and totally enclosed, the motor weighs 3½ lbs. and measures 5¾ in. in its overall length, 3 5/64 in. in overall width. It is available in continuous duty ratings from 1/30 to ¼ hp and for speeds of 5,600, 7,500 or 11,300 rpm. Ratings apply from sea level to 75,000 ft.

Circle No. 156 on Reader Service Card.

SURVIVAL KIT

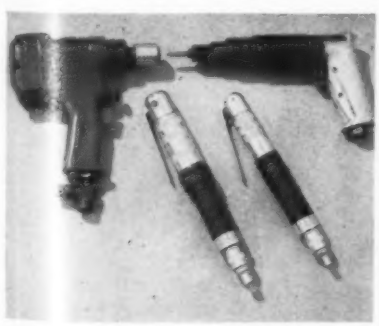
Almo Products offers a "vest-pocket" survival kit designed to be carried in an inside pocket. Items included in the kit are a compass, whistle,

fire starters, razor blade, boullion cubes, waterproof matches, chalk, water purifiers, line and hooks, and aluminum for cooking, all useful items when a flyer is forced down in rugged country.

Circle No. 155 on Reader Service Card.

POWER SCREWDRIVERS

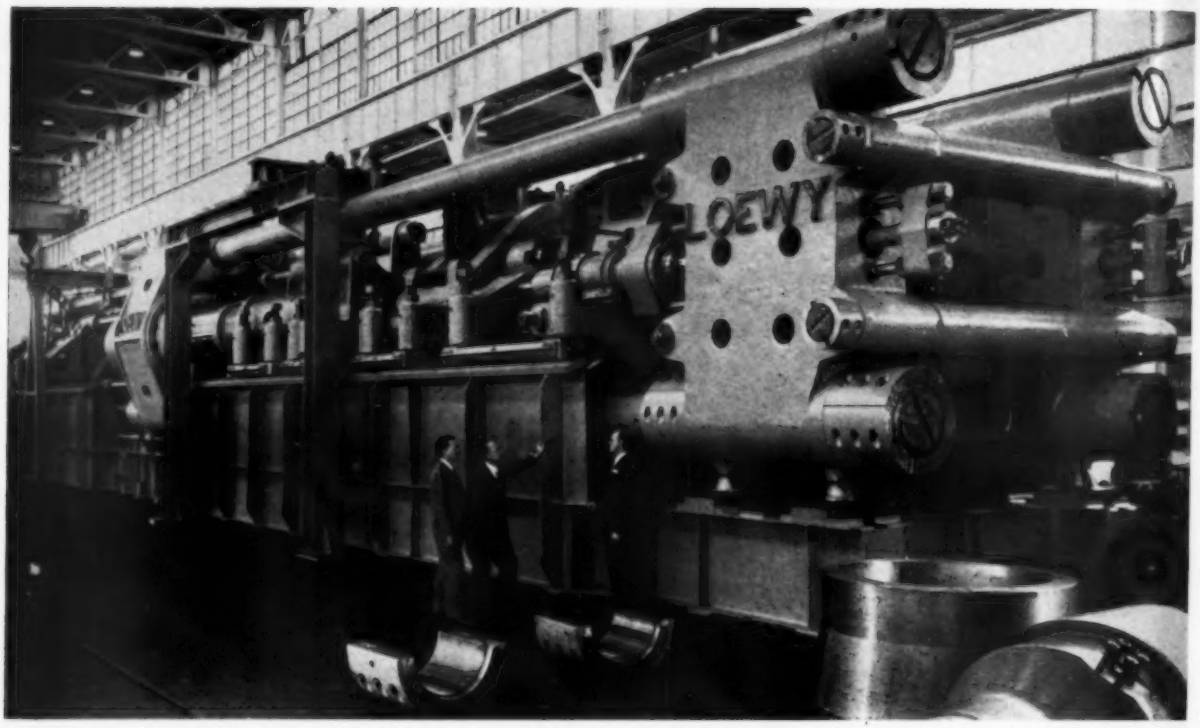
A series of torque-controlled, portable power screwdrivers and nutrunners for high production applications in the aircraft and other industries has



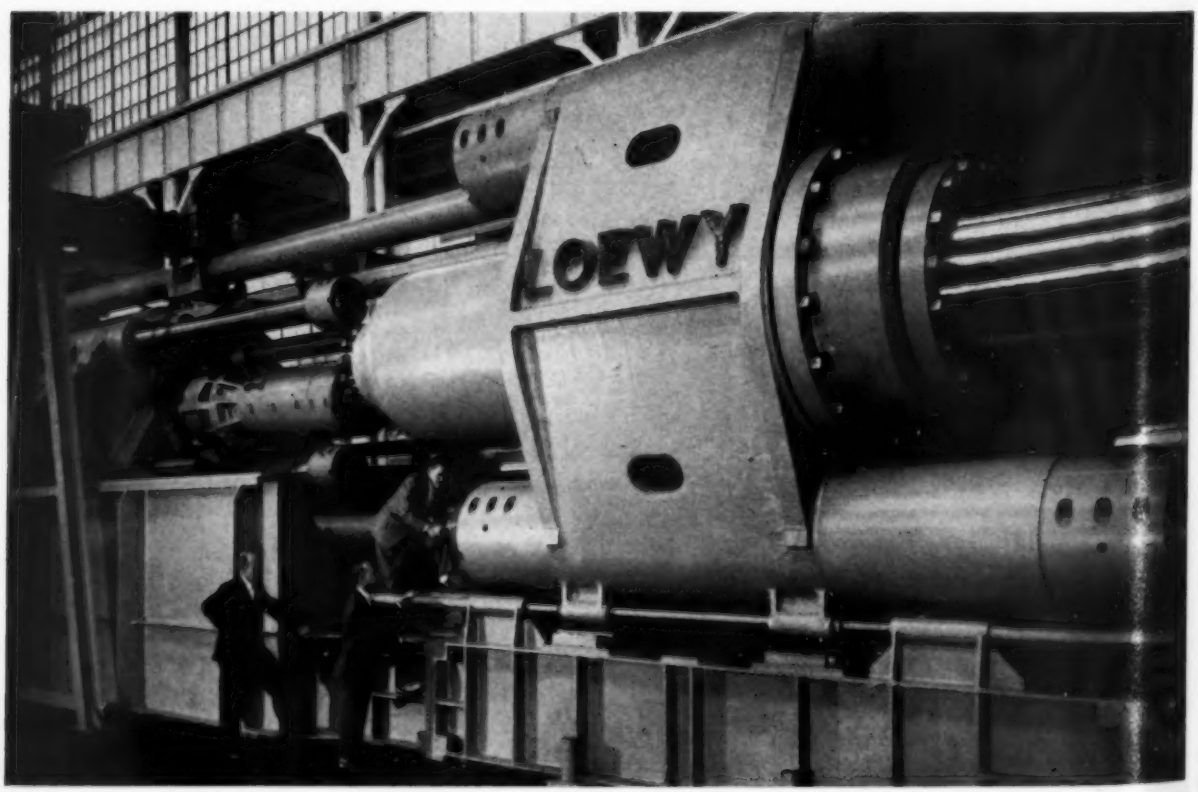
been developed by the Chicago Pneumatic Tool Co. Bearing the trade name Magnamatic, the tools feature a new type of magnetic clutch that is said to control fastener tightness with maximum precision.

Reduced work spoilage and clutch maintenance costs, as well as higher production rates, are claimed for the

FIRST KAISER ALUMINUM



Photographs (above and below) of one of the two new 8,000 ton presses, built by Loewy. Each press has two main cylinders with a total of 5,400 tons and 1 piercer cylinder of 2,700 tons. Maximum billet size will be 20" O.D. x 56" long. Maximum circle size will be 17" in diameter. Maximum weight per piece will be 1,200 lbs. Maximum finish length will be 85 feet.



Circle No. 28 on Reader Service Card.

8,000 TON PRESS

starts production of extrusions in September!

Second 8,000 ton heavy extrusion press soon to be operating at Kaiser Aluminum's Halethorpe, Maryland plant

THE FIRST of Kaiser Aluminum's two 8,000 ton heavy extrusion presses at Halethorpe will start operation in September—producing longer and wider extrusions up to 17" in cross section.

These new heavy extrusion presses—built in conjunction with the Air Force Heavy Press Program—are an important addition to Kaiser Aluminum's existing extrusion facilities.

The new Halethorpe heavy extrusion plant is completely equipped and fully integrated for the production of heavy extrusions exclusively. It contains the most modern heat-treating and finishing equipment, die shop and laboratory.

Included are both vertical and horizontal heat treating furnaces, a 1,500,000 pound stretcher, modern handling equipment for large extrusions, and shipping and inspection facilities.

In addition, the plant contains a modern remelting and casting department, homogenization furnaces, aging and annealing ovens, and induction billet heaters.

The second of the two giant presses will insure air frame manufacturers against delays and disrupted schedules due to temporary equipment shutdowns.

Major advantages to aircraft and other industries

The large extrusions to be produced by Kaiser Aluminum's two 8,000 ton presses offer potentially huge savings in both money and man-hours to the aircraft, transportation, electrical and other industries.

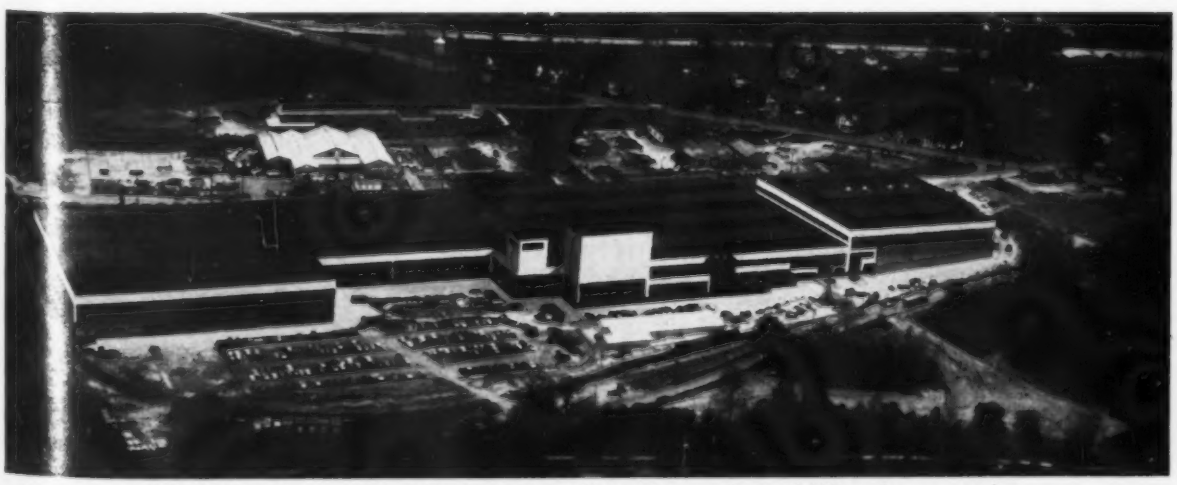
The use of these large extrusions will, in many applications, eliminate the costly production and assembly of smaller component parts.

Company engineers should prepare designs promptly in order to overcome the required lead-time and benefit from the presses' early operations.

Kaiser Aluminum engineers with long experience in extrusions are eager to work with you on your designs. If you would like to see how heavy aluminum extrusions fit into your production, you are urged to take immediate advantage of this service. Contact Kaiser Aluminum & Chemical Sales, Inc. *General Sales Office*, Palmolive Bldg., Chicago 11, Illinois. *Executive Office*, Kaiser Bldg., Oakland 12, California.

Kaiser Aluminum

setting the pace—in growth, quality and service



Aerial view of the new Kaiser Aluminum plant which will house the two 8,000 ton heavy extrusion presses. Plant is located adjacent to existing Kaiser Aluminum facilities at Halethorpe, Maryland.

Magnamatic. A new type of acoustic baffle lowers operating noise.

Thirteen models, including both reversible and non-reversible types, handle screw sizes from No. 4 to ⅜ in.

Circle No. 160 on Reader Service Card.

JET ENGINE HOIST

Regent Manufacturing Company is making a portable airborne hoist designed to simplify and speed up jet engine handling in hangars and on flight ramps.

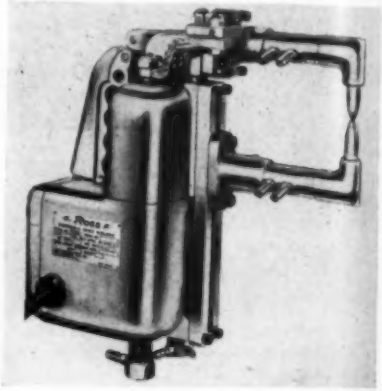
Designated the Regent Model H-1001, the hoist was developed to specifications of North American Aviation, Inc. It requires only two men for operation and is said to cost considerably less than equivalent other equipment. It is useful in handling missiles during loading and unloading.

Circle No. 157 on Reader Service Card.

PORTABLE SPOT-WELDER

Ross Machine Tool Co. has announced a portable spot-welder that features a built-in electronic timing control of the thryotron type, operating a solenoid contactor.

By setting the knob on the dial at correct timing interval, a uniformally fine weld is obtained, the company says. Watercooled, the self-contained unit is encased in aluminum housing. Other features include high amperage (over 17,000 at point of weld), throat depth



of 6 in., with variable opening from 3 in. to 11 in.; speed in welding steel and other metals of 3/16 in. combined thickness, and tips that are easy to adjust and replace. The unit weighs only 55 lbs.

Circle No. 161 on Reader Service Card.

AIRFOIL SPREADER

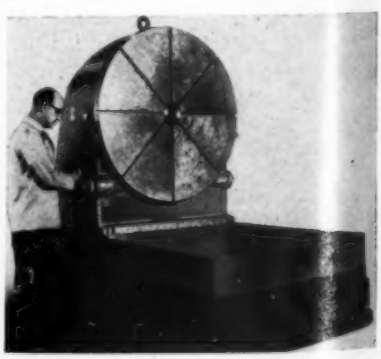
A 35% increase in dust flow is claimed for a new airfoil spreader made by Transland Co. The spreader, shown with rotary gate agitator attached, is adaptable to Stearman and other agricultural aircraft.

In flight tests in which 50 lbs. of dust were dispensed, the airfoil spreader gained an indicated airspeed of 87 mph and 13-sec. dust flow compared with the standard spreader's 80 mph speed and 20-sec. dust flow.

Circle No. 162 on Reader Service Card.

VERTICAL ROTARY TABLE

A 48-in. vertical rotary table, designed for inspecting large, heavy workpieces such as aircraft components, ma-



chine tool elements, jigs and fixtures, has been announced by Pratt & Whitney Division of Niles-Bement-Pond Company. It may also be used to provide

with ARC's NEW CD-1 Course Director

Now there's no need to sweat out ILS approaches or fight to maintain OMNI tracks! ARC's new Course Director automatically directs the pilot to the correct headings required for effectively intercepting and making good a desired track. Heart of the system, the Compass Slaved Directional Gyro, gives constantly corrected directional information. System is accurate to one degree.

Computer portion of the system combines directional and track information obtained from the Localizer/OMNI Receiver and makes computations to provide the pilot with correct heading to intercept and/or make good a desired track, compensates for cross-wind. It relieves the pilot of 90% of his mental effort, prevents missed ILS approaches, saves time, effort and fuel, assures greater safety. Ask your dealer for complete information.

Dependable Airborne Electronic Equipment Since 1928

ARC

Aircraft Radio Corporation

BOONTON, NEW JERSEY

Omni Receivers • 900-2100 Mc Signal Generators • UHF and VHF Receivers and Transmitters • 8-Watt Audio Amplifiers • 10-Channel Isolation Amplifiers • LF Receivers and Loop Direction Finders

precise work location on heavy equipment for boring, facing and other machining operations.

Table dial gradations read direct to one minute of arc. Vernier gradations read direct to two seconds. Fast power rotation in either direction is provided by a ¾ hp reversible motor.

Circle No. 158 on Reader Service Card.

MOTOR-GENERATOR SET

Electric Machinery Mfg. Co. has developed a 5 kw, 400-cycle motor-generator set, equipped with a rectifier exciter and a magnetic amplifier voltage regulator, built to Air Force specifications for calibrating, testing or servicing

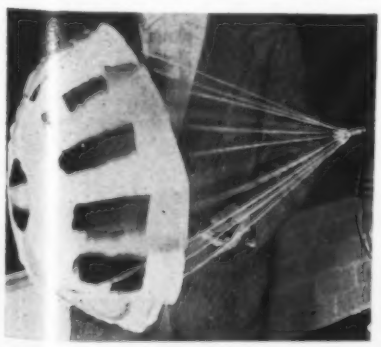
400-cycle communications, radar and flight control equipment.

Output may be either 120 volts single phase or 120/208 volts three phase, with voltage regulation of ± 1 volt and recovery time of 0.2 sec. The generator is of "mono-coil" design, requiring only a small amount of excitation. The drive motor is a "squirrel-cage" induction unit operated on 220 or 440 volts.

Circle No. 159 on Reader Service Card.

ROTATING PARACHUTE

A new type of parachute called the Rotafoil, that rotates automatically and



is said to provide greatly increased drag and stability, has been developed by the Radioplane Co., a subsidiary of Northrop Aircraft, Inc.

Experiments indicate that the parachute has many applications in the fields of deceleration, supply dropping and delivery of munitions and weapons. It is not intended as a personnel chute.

The Rotafoil is said to derive its extra drag from centrifugal force that causes the skirt of the chute to flare out. Rapid spinning action ranges from 1,500 to 3,000 rpm. A low-friction swivel permits the chute to rotate without twisting the shroud lines.

Circle No. 163 on Reader Service Card.

AIRCRAFT BLOWER

Propulsion Research Corp. has developed a compact blower designated Model 100, that utilizes unusual features to obtain high static pressure rise. Its jet-engine type 5-in. diameter rotor is employed to obtain high pressure rise through speeds up to 38,000 rpm. Rotor delivers approximately 65 in. of water static head rise at sea level with a static efficiency of more than 75% from the hydraulic energy input to the static pressure rise output.

A special bearing, with bronze-

in Omni equipment also . . .

IT'S EASIER WITH TWO!

A helper on any job brings results with half the effort . . . and in flight navigation a dual ARC Omni installation can double the pilot's efficiency, ease and confidence. He can make a fix *faster* with dual omni 15D equipment . . . fly any omni track while also cross-checking for position. And it's easier to make transition from omni to runway localizers.

Where there are two pilots, the work load can be shared by using both omni instruments simultaneously for different jobs.

ARC 15D Omni is compact, lightweight, CAA certified. Its new course indicator now combines course selector and cross-pointer meter in a *single* space-saving unit.

Let ARC DUAL Omni lessen your flight fatigue. Detailed specification data on request.

Dependable Airborne Electronic Equipment Since 1928

Aircraft Radio Corporation

BOONTON, NEW JERSEY

Omni Receivers • 900-2100 Mc Signal Generators • UHF and VHF Receivers and Transmitters • 8-Watt Audio Amplifiers • 10-Channel Isolation Amplifiers • LF Receivers and Loop Direction Finders

Circle No. 29 on Reader Service Card.


TOMORROW'S AIRCRAFT: One step closer
At Air Arm...
flight testing
is FIGHT testing
EMERGENCY
ONLY

Air Arm has what it takes to develop and produce the best in airborne electronics equipment. A key factor is the Flight Test facility that puts systems through actual tactical situations . . . a facility that is second to none in the industry.

Far from being a fledgling in this activity, Air Arm's Electronic Flight Test Center is three years matured and still expanding. This unique facility is at the main plant and connected by taxi strip to Baltimore's modern Friendship International Airport. Westinghouse owned and operated, it consists of 48,000 square feet of hangar area, electronic test and administrative sections.

FIGHT Testing airborne systems is the job of Air Arm's Flight Test Center. Here, eight former military pilots, men with aviation backgrounds which total over a century of flying experience, keep as many as 16 prop and jet aircraft on the go. They subject equipment to every possible airborne rigor *before* it goes into operational aircraft. 110 highly trained and experienced Flight Test personnel—engineers, technicians, mechanics, armorers and aerologists are working hand in hand to insure that pilot, aircraft and airborne system form a perfectly matched combination for peak efficiency and performance.

Air Arm Flight Test is one of the many specialized facilities which enable us to produce the best in airborne electronics equipment and . . . to help you bring tomorrow's aircraft . . . One Step Closer. Westinghouse Electric Corporation, Air Arm Division, Friendship International Airport, Baltimore 27, Maryland. J-91030-B

Chief Project Pilots, Tom Lloyd and Fred Hughes, join on the ground, prior to debriefing, following an afternoon air-to-air gunnery check on a fighter armament system.

THE AIR ARM SYSTEMS FAMILY . . .

- **Fighter Armament**
- **Bomber Defense**
- **Flight Control**
- **Missile Guidance**
- **Special-Purpose**
- **Systems Components**

YOU CAN BE **SURE**...IF IT'S

Westinghouse

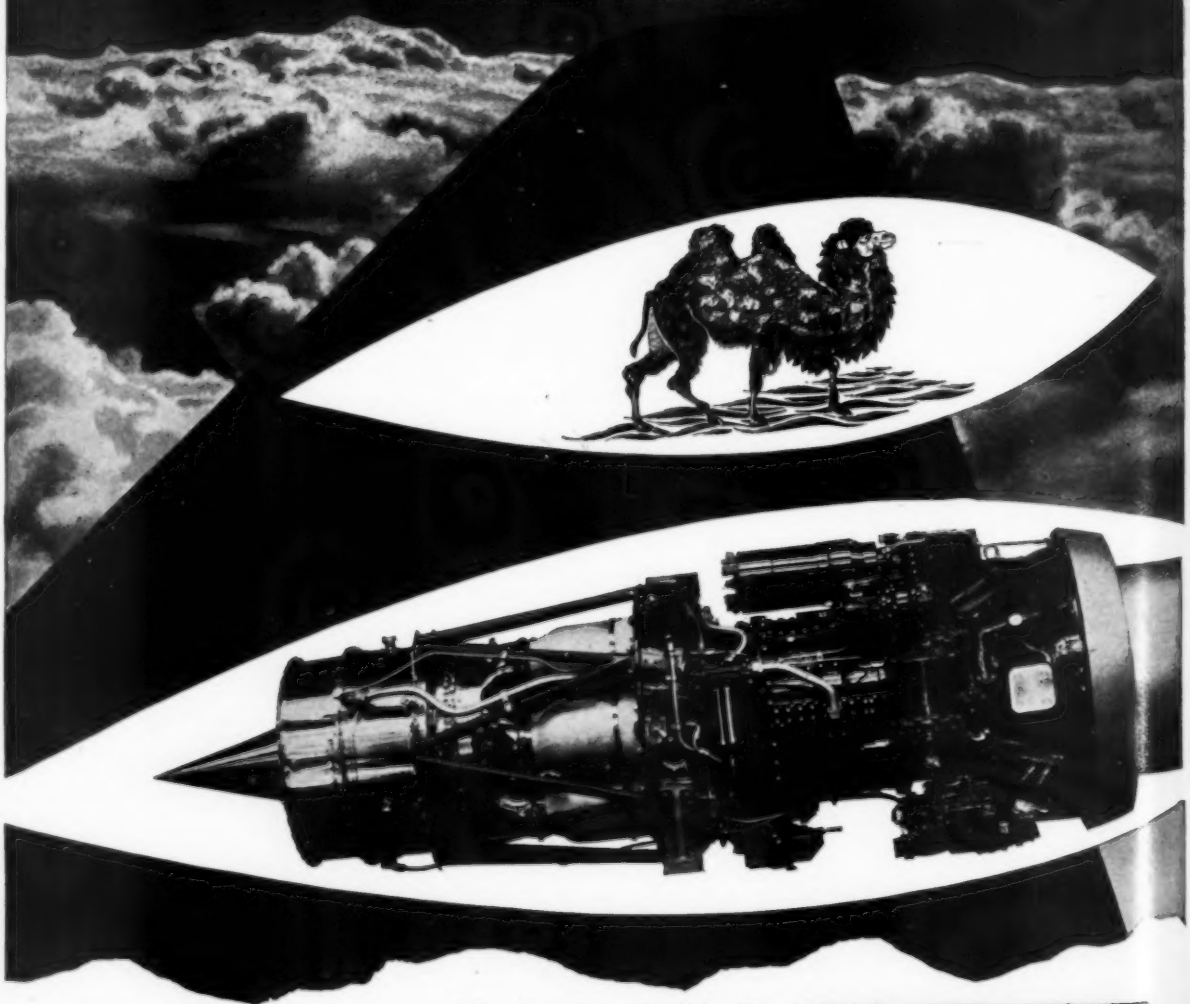
Circle No. 30 on Reader Service Card.

low fuel consumption

Specific fuel consumption of the Napier Eland propeller-turbine is very low indeed—0.450 lbs./e.h.p./hr. at 36,000 ft. 400 knots cruising, or 0.505 lbs./e.h.p./hr. at 20,000 ft. 350 knots cruising. This means a great deal to the operator in terms of payload, performance and direct operating cost.

more facts about the Eland

* High aerodynamic efficiency—3,000 e.h.p. in a maximum diameter of 36 inches.
* Low specific weight—0.52 lbs./e.h.p.
* Easy maintenance—independent unit construction.
* Ease of control—single lever control, with manual over-ride, guards against engine over-speeding and over-fuelling.
* Automatic temperature compensation.
* At the first attempt the Eland has recently passed a 150 hour type test rehearsal at the full 3,000 e.h.p. rating.



NAPIER Eland turbo-prop

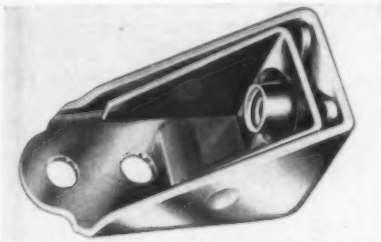
steel retainers instead of the phenolic ball retainers used in conventional high-speed bearings, makes the blower suitable for use under extremely high temperatures.

The unit is 15 in. high, 8½ in. wide at the mounting flange, and weighs 15 lbs.

Circle No. 164 on Reader Service Card.

BRACKET NUT

Kaynar Co., Kaylock Div. has introduced a new right angle bracket nut designed to meet temperatures up to 800°F. New unit uses the all-metal



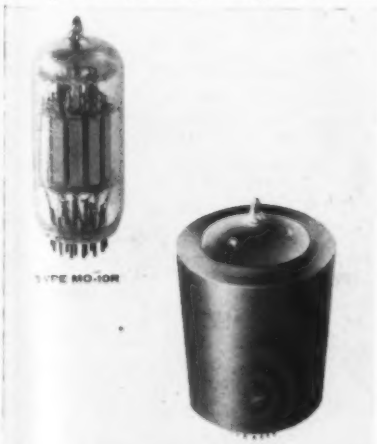
self-locking principle in which the upper threads of the nut are made elliptical to dispense with auxiliary locking devices. Bracket nut is non-magnetic for use in electrical applications.

Circle No. 165 on Reader Service Card.

BEAM SWITCHING TUBE

Haydu Brothers, subsidiary of Burrough Corp., has made available production quantities of their new Magnetron Beam Switching tubes.

The type MO-10R, with ten discrete positions, forms, clears, or switches



an electron beam and has internally mounted spade load resistors that permit operation at a frequency greater than 1 mc.

The device is claimed to show promise for application to the problem of simple and reliable generation of coded pulses at intervals of 2.9 microseconds in the ATC transponders being developed.

Circle No. 166 on Reader Service Card.

AIR RESCUE FOR A WATER-SOAKED PILOT

Today, a new *Retriever* flies for the U. S. Navy. It's the new Piasecki HUP-4. Small, compact and highly efficient, the HUP-4 is an advanced version of the HUP-2—the first helicopter designed specifically for the Navy.

Like its popular ancestor, the HUP-4 is another great forward stride in Piasecki helicopter design and development. Hauling "dunked" pilots out of the sea is only one of the many important tasks it will perform for the fleet throughout the world. Its large increase in power results in higher speed, longer range and greater payload.

This is just another outstanding result of Piasecki Helicopter Corporation's increasing effort to improve helicopter performance – build helicopters that do more jobs and do them better than ever before.

FIRST IN TANDEM TRANSPORT HELICOPTERS

Piasecki HELICOPTER CORP. MORTON, PENNSYLVANIA

Circle No. 31 on Reader Service Card.

People

MANUFACTURING

C. Hart Miller named exec. asst. to president and chief exec. officer of Northrop Aircraft, Inc.; **George H. Buchner** appointed to new position of director of contracts and spare parts.

Miller

Buchner

Arthur Townhill joined the Harvill Corp., as director of engineering.

D. C. Burrows appointed controller of Convair; **Kent M. Campbell** appointed asst. mgr. of Dayton office.

Adm. Alan G. Kirk elected president of Alloy Precision Castings Co., Cleveland.

Douglas C. Lance appointed sales promotion and advertising mgr. of Axelson Mfg. Co., division of U. S. Industries, Inc.

Andrew F. Haiduck elected exec. vp—manufacturing and **Chester D. Seftenberg** elected vp and treas. of Lear, Inc.

Robert W. Phillips appointed chief engineer of Flex-O-Tube Div. of Meridan Corp.

John H. Adams, Jr., named asst. personnel mgr. of Hamilton Standard Division of United Aircraft Corp.

John A. Wilson appointed mgr. of contracts and legal division, Hiller Helicopters.

Richard Hodgson elected vp of Fairchild Camera and Instrument Corp.

Logan Monroe made vp-controller of Eaton Mfg. Co.; **Herbert S. Ide, Jr.,** elected vp-treasurer; **Raymond G. Hengst** elected secretary.

Frederick J. W. W. Digby named second asst. chief designer for new projects at Folland Aircraft Ltd.

Joseph P. D'Arezzo appointed divisional vp of American Machine & Foundry Co.'s Defense Products Group.

Edward P. Gebhard named technical director of defense products division of The M. W. Kellogg Co., a subsidiary of Pullman Inc.

Clyde O. Benscoter appointed to newly created position of purchasing agent for Lockheed Aircraft Service-International.

Alexander F. Johnston replaces **R. T. R. Gill,** resigned, as press officer of the Society of British Aircraft Constructors.

H. Leslie Hoffman elected president of Radio-Electronics Television Manufacturers Assn.

D. R. Tacke promoted to chief of development, a new position in Temco Aircraft Corp.'s engineering department; **Robert F. Jones** named exec. asst. to vp-engineering.

James A. Stadler appointed vp and gen. mgr. of Ozone Metal Products Corp.; **Edmund D. Holland** elected vp; **William E. Criley** continues as sales mgr.

B. A. Daley promoted to chief engineer of defense division of Servel, Inc.

Felix A. Chardon named mgr. of aircraft quality control for Kaiser Metal Products, Inc.

Harold Nutt elected president and gen mgr. of Borg & Beck Division of Borg-Warner Corp.

AIRLINES

John S. Pugh resigned as director of traffic and sales for Hawaiian Airlines to become gen. sales mgr. for Trade Wind Tours.

Carlos V. Pellerano named mgr. for Dominican Republic by VARIG Airlines of Brazil.

Harold M. Bixby retired July 1 as vice president of Pan American World Airways.

John B. Montgomery elected asst. vp-operations and **Eugene C. Taylor** elected asst. vp- customer service, American Airlines.

Benscoter

Paul L. Benscoter named vp-orient region of Northwest Orient Airlines.

G. Hamilton Beasley, asst. to president of West Coast Airlines, elected exec. vp; **Thomas R. Croson** elected vp in charge of sales.

G. C. Riordan appointed to new position of mgr. of reservations and ticket offices for Trans World Airlines.

Robert B. Minogue moved up from assistant director to director of the Military Bureau of Air Transport Association.

Minogue

Ralph F. Link, deputy chief, operations branch of Civil Aeronautics Admin.'s New York Center, joined Air Transport Assn.

Arthur T. Cartier appointed director of public relations for Central Airlines.

Capt. Jesse Lloyd Morrison appointed mgr. and chief pilot, Trust Territory Div., Transocean Air Lines.

HONORS

Ken Smith, publicity mgr. for Western Air Lines, elected president of Publicity Club of Los Angeles.

Ed Heinemann, chief engineer of Douglas-El Segundo, awarded the Federation Aeronautique Internationale's Paul Tissandier Diploma in recognition of his outstanding contributions to U. S. aviation.

William Littlewood, vp of American Airlines, elected to five-year term as alumni trustee on the Cornell University board.

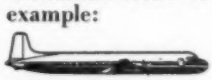
W. A. Patterson, president of United Air Lines, and **William Littlewood** elected chairman and vice chairman, respectively, of the Industry Advisory Committee of the Flight Safety Foundation.

Wing Cmdr. Gerald G. Wright, D.F.C., received the McKee Trophy, originally known as the Trans-Canada Trophy, as the person who contributed the most during the previous year to the progress of aviation in Canada.

Engineers!

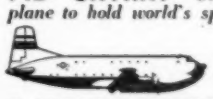
Join this winning team!

At DOUGLAS you'll be associated with top engineers who have designed the key airplanes and missiles on the American scene today. For example:



DC-7 "SEVEN SEAS" *America's finest, fastest airliner*

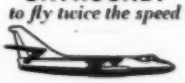
F4D "SKYRAY" *Only carrier plane to hold world's speed record*



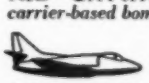
C-124 "GLOBEMASTER" *World's largest production transport*

NIKE *Supersonic missile selected to protect our cities*

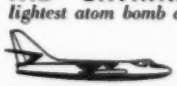
"SKYROCKET" *First airplane to fly twice the speed of sound*



A3D "SKYWARRIOR" *Largest carrier-based bomber*



A4D "SKYHAWK" *Smallest, lightest atom bomb carrier*



B-66 *Speedy, versatile jet bomber*

With its airplanes bracketing the field from the largest personnel and cargo transports to the smallest combat types, and a broad variety of missiles, Douglas offers the engineer and scientist unequalled job security, and the greatest opportunity for advancement.

For further information relative to employment opportunities at the Santa Monica, El Segundo and Long Beach, California, divisions and the Tulsa, Oklahoma, division, write today to:

DOUGLAS AIRCRAFT COMPANY, Inc.

C. C. LaVene, Employment Mgr.
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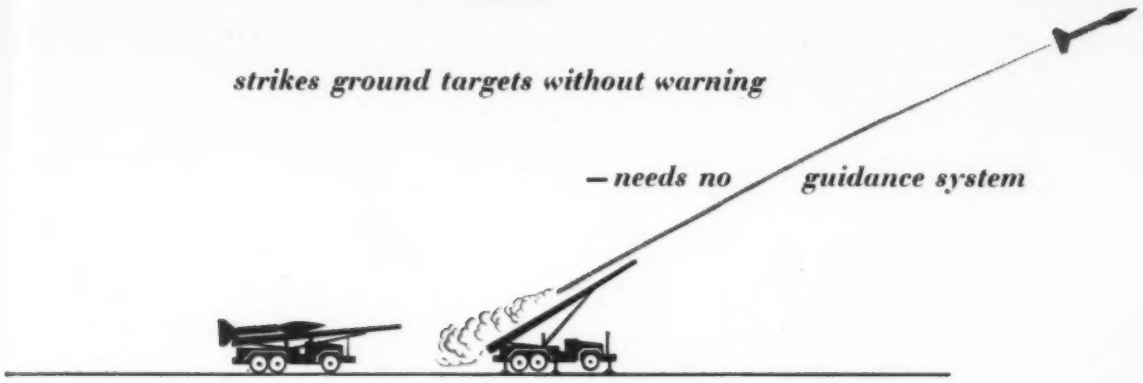
strikes ground targets without warning

— needs no guidance system



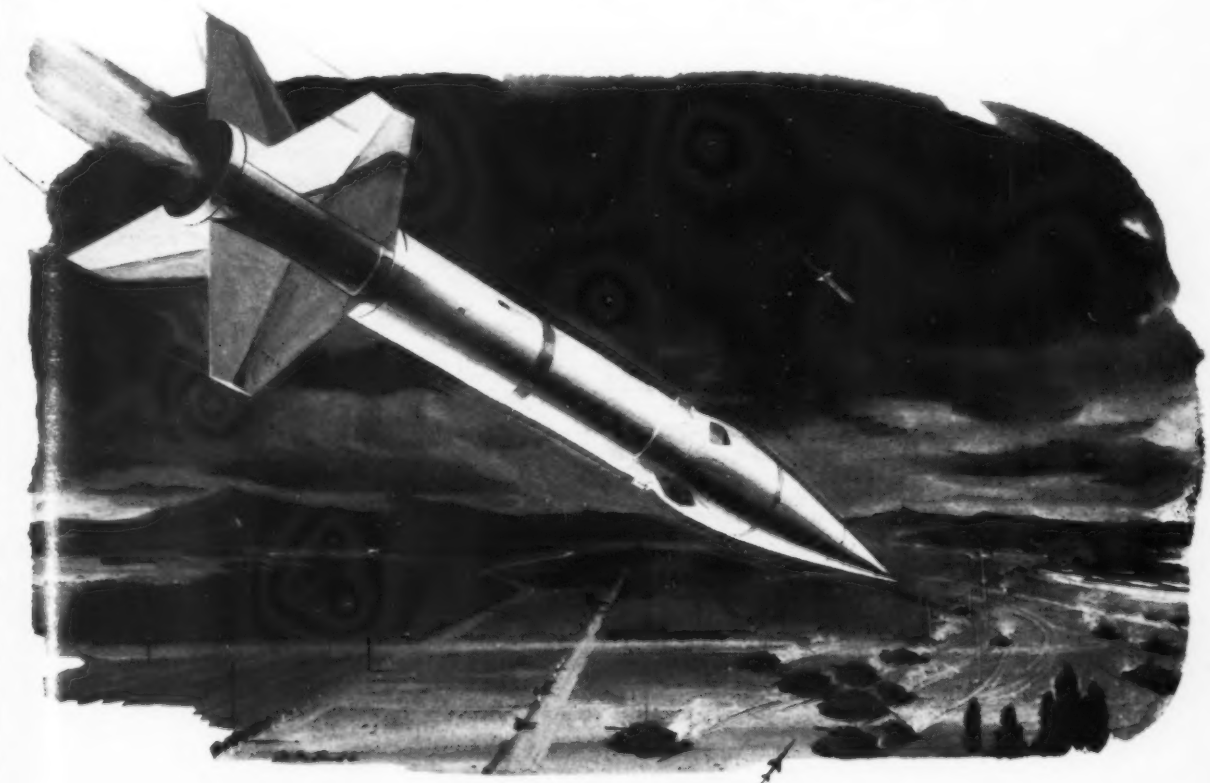
— the U. S. Army's

Douglas-designed HONEST JOHN

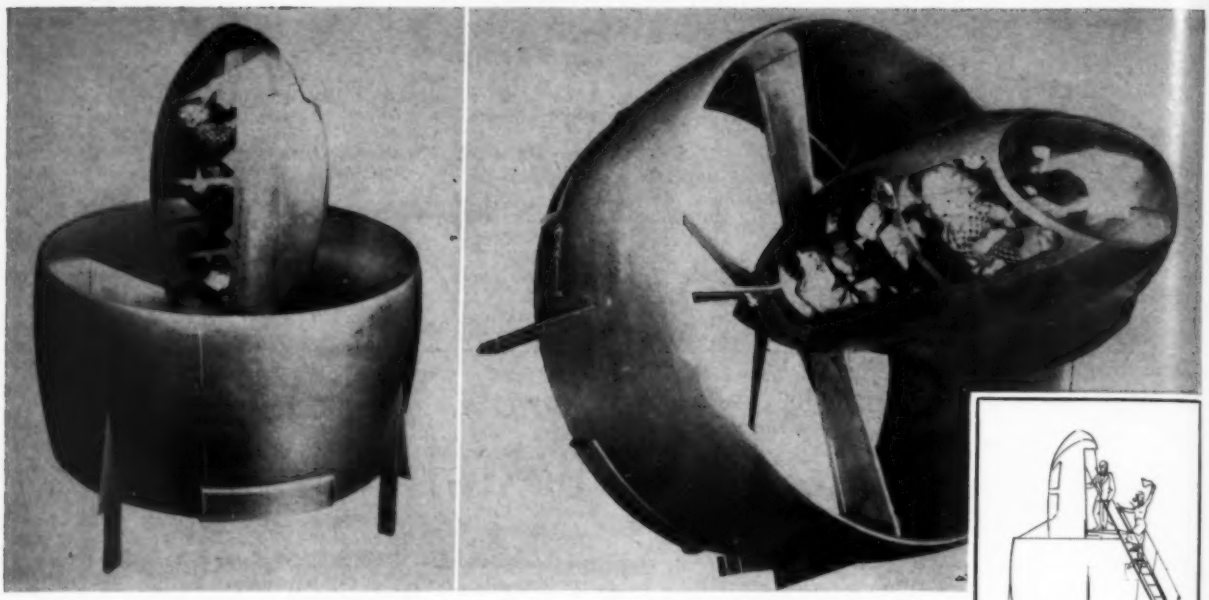
Add to the U. S. Army's ever-growing arsenal of rocket weapons a new ground-to-ground missile . . . the Douglas-designed Honest John.

Developed in co-operation with Army Ordnance—and already being delivered to troop units—Honest John is a free flight rocket without complicated guidance system, and designed to supplement artillery in the medium to heavy range. Honest John is extremely mobile, moves quickly into position on a special truck which also serves as transport *and* launcher. Highly accurate, this rocket can handle either an atomic warhead, or a single high explosive round equalling the explosive force of hundreds of rounds of artillery shells.

Design of Honest John and other missiles is further evidence of Douglas leadership in its field. Now that the time to produce missiles in quantity is come, Douglas manufacturing skill is ready and able for the job.

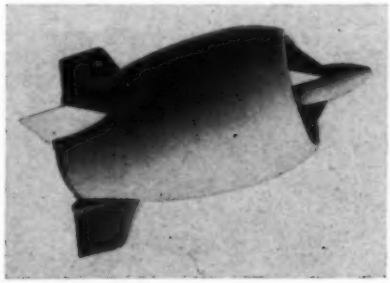


Depend on *DOUGLAS* **First in Aviation**



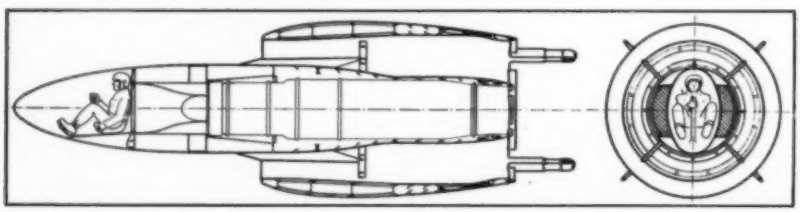
BTZ HANNETON IIIA personal aircraft is built round two Turbomeca Marcadau III turboprops. It is a six-seater capable of cruising at 375 mph with a range of 1,250 miles.

New French Coleopter Design Details

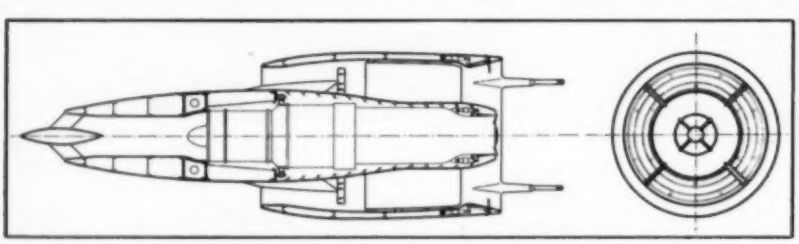


OGRE 1 is a BTZ Mach 0.7 surface-to-surface missile powered by a ramjet assisted by a liquid-fuel booster rocket for take-off.

Details of several coleopter designs have been disclosed by Bureau Technique Zborowski, the French company headed by Helmut von Zborowski, which specializes in models with cylindrical bodies surrounded by annular wings (American Aviation, May 23). In addition to piloted fighters, the BTZ company has come up with detailed designs for anti-tank missiles, infantry missiles, long-range surface-to-surface missiles and pilotless interceptors. In the piloted aircraft field, the firm has designed a personal or light communcations plane. BTZ is located at 1 Avenue d'Orleans, Brunoy, Seine et Oise, France.



THIS IS A BTZ PILOTED GROUND ATTACK FIGHTER using turbojet plus ramjet power.



THIS BTZ UNMANNED INTERCEPTOR uses turbojet plus ramjet power.

BTZ LUTIN is an infantry missile with a range of three miles and warload of nine lbs. weighing 33 lbs. It is ramjet-powered with a booster rocket used for take-off.

Technical Literature

TRACTOR-AIR COMPRESSOR UNIT. An eight-page bulletin published by the Le Roi Division of Westinghouse Air Brake Co. describes the numerous applications of Le Roi's new 125 Tractair, which can be used for towing planes.

Circle No. 101 on Reader Service Card.

DAMPING DEVICES. The Gabriel Co. has published what it describes as the first comprehensive book ever written on the history, design, construction and operation of damping devices. Titled "Damping Devices—Past, Present, Future," the 20-page pamphlet is profusely illustrated and contains many charts and diagrams.

Circle No. 102 on Reader Service Card.

HOT DIE STAMPING. "Color Brand Your Products for Life" is a 14-page booklet issued by M. Swift & Sons, Inc. which serves as a guide for trademarking, decoration and identification of products by hot die stamping.

Circle No. 103 on Reader Service Card.

ELECTRON TUBES. A 24-page booklet describing the purpose, membership, operation and history of the Advisory Group on Electron Tubes, an agency of the Office of the Assistant Secretary of Defense for Research and Development. Address requests to New York University Secretariat, Advisory Group on Electron Tubes, 346 Broadway, New York 13, N. Y.

AIRCRAFT BOLTS AND RIVETS. Two new 12-page brochures have been issued by Huck Manufacturing Company describing its SAL-Shear aircraft Huckbolt and SLS-Shear Huckbolt stump. Copies may be obtained by requesting No. 8-350 for the SAL and No. 8-353 for the SLS.

Circle No. 104 on Reader Service Card.

STORAGE EQUIPMENT. Many new ideas in space and time-saving storage equipment are described and illustrated in a 16-page catalog issued by the Frick-Gallagher Manufacturing Co. Racks, bins, shelves and pallet frames useful in the efficient and orderly storage of materials are described.

Circle No. 105 on Reader Service Card.

STAINLESS FASTENERS. Allmetal Screw Products Co. has issued an eight-page condensed stock list of the company's screws, bolts, nuts, washers, rivets, nails and pins.

Circle No. 106 on Reader Service Card.

POWER TUBE-FLARER. Details and illustrations of the Parker Appliance Company's Model 232B power tube-flarer, including operating instructions for 37 deg. or AN flaring, squaring and burring, and beading of tubing, are published in an eight-page catalog, No. 1145A12.

Circle No. 107 on Reader Service Card.

BORING AND FACING HEADS. The Maxwell Co. has issued a six-page catalog on Maxwell E-Z Set boring and power-facing heads. Charts give dimensions of all items.

Circle No. 108 on Reader Service Card.

STRIPPABLE PLASTIC COATING. Spraylat Corp. has issued a new four-page bulletin describing the uses and characteristics of its strippable plastic coating, Spraylat SC-1071B, employed in the temporary protection of lacquered, painted and enameled surfaces.

Circle No. 109 on Reader Service Card.

SPOT WELDER. An eight-page bulletin that describes the Sciaky Type PMCO 2 ST air-operated, press-type three-phase modu-wave spot welder has been released by Sciaky Bros., Inc. The bulletin includes charts, photographs, schematic drawings and tabular data.

Circle No. 110 on Reader Service Card.

UNDER WAY

. . . the development of NUCLEAR AIRCRAFT at CONVAIR--Fort Worth

Progress is being made in the Applied Nuclear Field at CONVAIR — Fort Worth — in nuclear analysis, design and experimentation, including the fields of shielding, radiation effects and nuclear aircraft technology.

As an integral part of General Dynamics Corporation's program of pioneering in Nuclear Fields, CONVAIR'S activities afford inviting opportunities for engineers and physicists to enter into Nuclear Development at its most advantageous stage.

CONVAIR'S Nuclear Program offers highly rewarding career opportunities both by way of professional accomplishment and personal income. A company-sponsored, in-plant program enables candidates to earn graduate degrees in Nuclear Engineering.

Fort Worth in the Great Southwest has an abundance of sunshine and dry, fresh air conducive to outdoor living and recreation. Within a few minutes drive of Fort Worth are seven large lakes which provide ample facilities for fishing and other water sports.

For further details write M. L. TAYLOR
CONVAIR Engineering Personnel Dept. UU
Fort Worth, Texas

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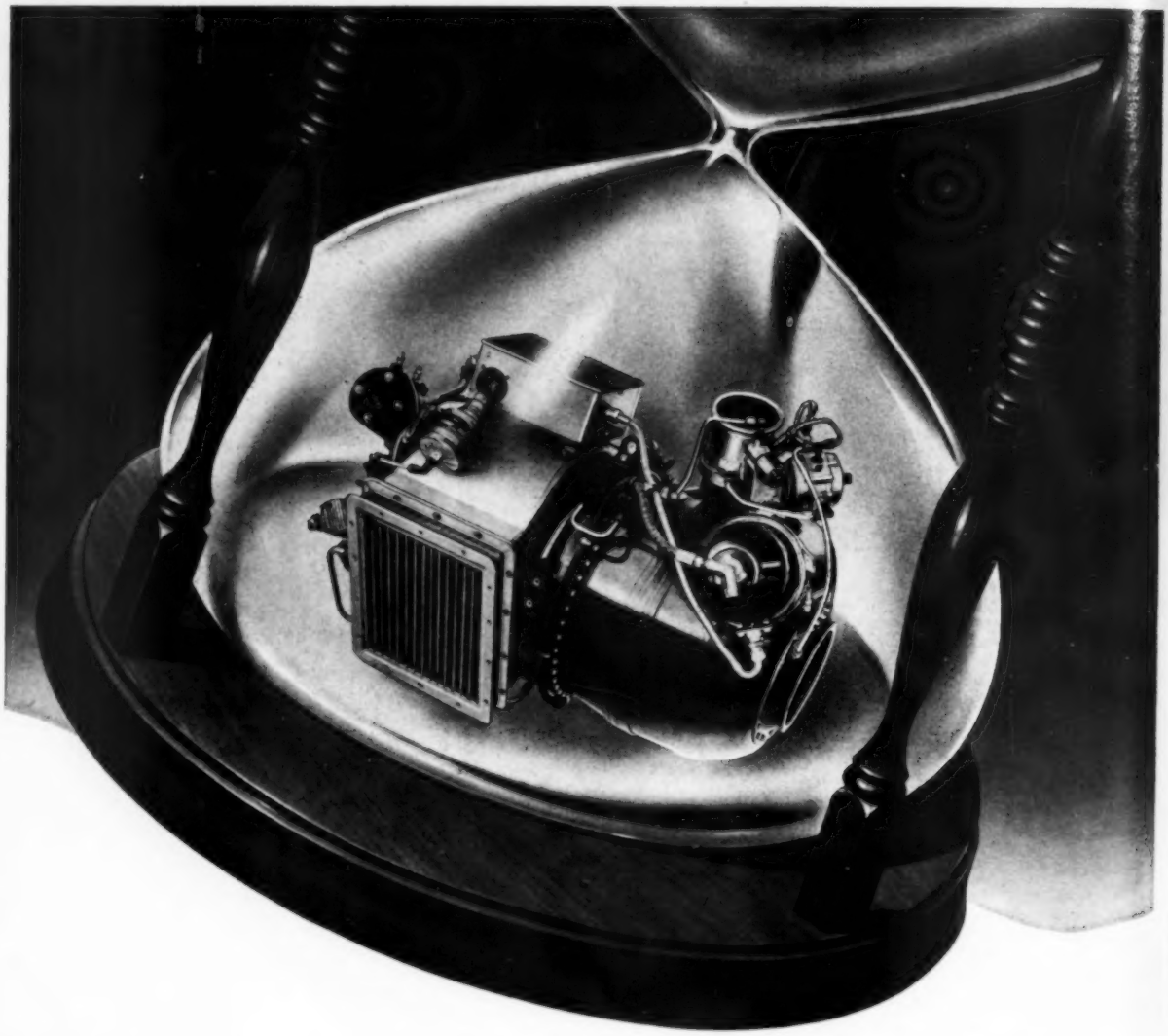

Small gas turbines pass test of time

New Milestones Gain Industry-wide Acceptance for AiResearch Power Turbines

AiResearch small gas turbine engines, first of this revolutionary class of turbomachinery to be developed, have now passed the following important milestones:

• 100,000 hours of actual service in the field • Successful operation up to altitudes of 53,000 feet • Completely reliable automatic control on production machines • Customer established overhaul periods of up to 600 hours on existing units • Design overhaul periods on new models of 1000 hours • All phases of military qualification (Including new shaft power and gas turbine compressor designs).

Pioneer in this field, AiResearch is first to develop and deliver combination units capable of delivering either shaft or bleed air power independently of each other. AiResearch has more experience with small gas turbines than all other manufacturers combined.

We are proud of the engineering-manufacturing team that has made possible these outstanding contributions to industry.

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AiResearch Manufacturing Divisions

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Designers and manufacturers of aircraft components: REFRIGERATION SYSTEMS • PNEUMATIC VALVES AND CONTROLS • TEMPERATURE CONTROLS CABIN AIR COMPRESSORS • TURBINE MOTORS • GAS TURBINE ENGINES • CABIN PRESSURE CONTROLS • HEAT TRANSFER EQUIPMENT • ELECTRO-MECHANICAL EQUIPMENT • ELECTRONIC COMPUTERS AND CONTROLS

Circle No. 32 on Reader Service Card.

Maintenance Bulletin Board

NEW FILM EXPLAINS theory behind dye penetrant inspection process, depicts production line use in aircraft manufacturing industry.

Turco Films Dye Penetrant Movie

Turco Products, Inc. has completed filming of a new full-color and sound movie covering every aspect of flaw location in materials by dye penetrant methods.

The Turco film, a 23-minute 16mm projection, is being made available for free showing to industrial concerns and technical groups throughout the U. S.

Featured in the movie are on-the-spot inspections filmed of wing spars and aircraft parts during production line activities at Northrop Aircraft, Inc. A laboratory sequence is included to describe the theory behind dye penetrants and proper methods of assuring complete inspection accuracy.

Circle No. 199 on Reader Service Card.

Martin Vacuum Rig Eliminates Dents

Time-saving maintenance tool developed at The Glenn L. Martin Co. to smooth out dents in aircraft wing-tip tanks is a portable vacuum device that actually pulls the tank skin back into place.

Until its development, practice at Martin in repairing damaged tanks called for cutting the tank apart. With this method, repair labor costs ran high.

To speed the operation, company technicians devised the vacuum technique which returns the tank skin to smooth aerodynamic contours. A plate, formed to the contour of the tank, is simply placed over the dent and sealed with a sponge rubber gasket. Connections are then made to a two-stage vacuum pump, vacuum is applied, and the dents "pop" right out.

Experience at Martin shows that the tool is not limited to skin repairs. Even deformed stiffeners and stringers under the dented skin have been

straightened by the new method. Portable nature of the device also makes it useable in a variety of locations—at the airport, in the shop, or in final aircraft assembly.

Plastic Coating Speeds, Cools KLM Connies

A foam plastic treatment of Super Constellation propellers helps cool the plane's engines and increases its speed about five miles per hour, KLM Royal Dutch Airlines has found.

The propeller blade is scoured clean and brought to proper temperature by extremely hot lamps. Then 400 grams of foam plastic are applied to the trailing edge of the blade, flattening the round shape at the hub. Next the blade is placed in an oven, where the heat hardens the plastic. Sheet rubber is fixed to the plastic and a final coat of paint applied as protection against the weather.

CAL Buys RCA Radar For Convair Fleet

Program for early installation of C-Band airborne weather radar built by Radio Corporation of America has been announced by Continental Air Lines.

First installations on the airline's six Convair 340 aircraft are slated to start this month, CAL president Robert F. Six said, with similar modifications planned for three additional 340s and CAL's three DC-6s early next year.

Five new DC-6B aircraft scheduled for delivery to Continental during 1957 will have radar installed by Douglas at the factory, giving CAL a full radar-equipped fleet by early 1958.

Circle No. 33 on Reader Service Card.

Can the whirlybird

Why not? New York has regular flight service right now . . . so have Newark, Los Angeles and parts of Florida. They're already flying 40-passenger military jobs, got 70 and 100-seaters on the drawing boards . . . jet advances are adding fresh impetus . . . they're licking the load problems, stretching the range, bumping up the speed, cutting flying costs.

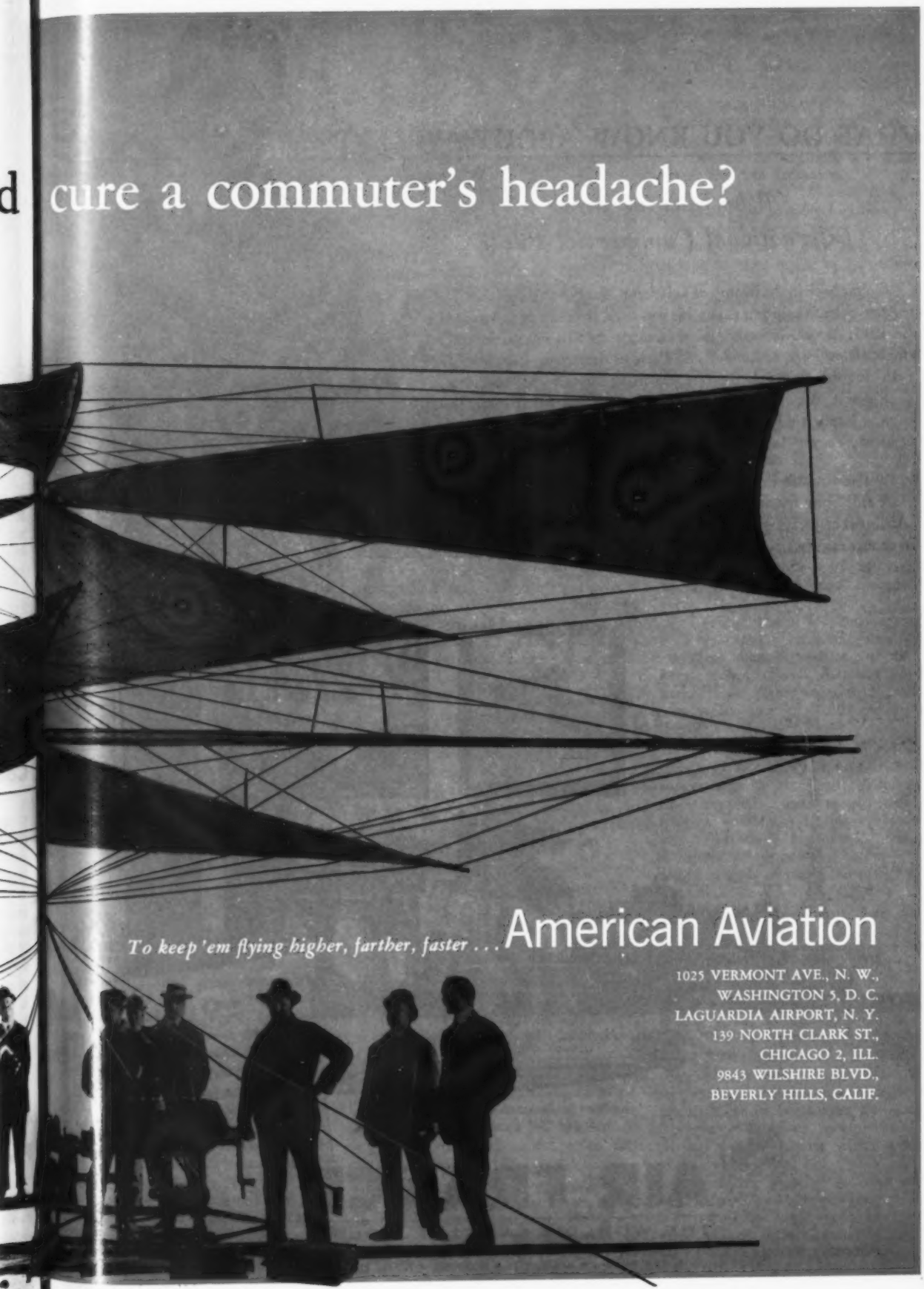
You watch it happening here in AMERICAN AVIATION . . . the helicopter's push to mass transportation . . . the swift technological strides in *aircraft building, engine manufacture, equipment* . . . the great growth of the *airlines and terminal airports* . . . the vast, accelerated program of the *military* . . . the intricacies of *government* control . . . the enthusiastic air-mindedness of *civilian and business plane operators.*

Here is a market spending $10 billion-a-year in new planes alone, more billions in capital investment, research and development . . . a field fast outstripping all other transportation and defense arms. Here is a sprawling giant of an industry where many skills and vocations are integrated in the common cause . . . to keep 'em flying *higher, farther, faster!*

And here is the magazine that meshes the interests of all the influential men in the market. 43,435 strong! More purchasing-powered readers . . . more editorial awards than all other aviation magazines combined . . . more power to push your product all over this multi-billion dollar industry. *Ask us how* AMERICAN AVIATION *can best serve you.*

WHO BUILT THE FIRST COPTER?
This isn't it . . . Leonardo da Vinci fathered the first model back in the 15th Century. Here's the Luyties Helicopter, the largest model ever tested up to 1907. It never flew . . . but such experiments were important steps in developing the Piasecki 40-passenger Transporter which many view as the first answer to a commuter's prayer.

d cure a commuter's headache?



To keep 'em flying higher, farther, faster . . . American Aviation

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WHAT DO YOU KNOW ABOUT AVIATION...

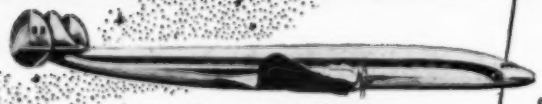
Who Was the First International Commercial Pilot?

Go far back in the history of aviation to answer this question. Here are a few clues to help you along. He was born in 1890, made his first flight in 1911. As an Air France pilot, he made the first international flights from Paris to London and Paris to Brussels in February, 1919. In August of the same year he was first to fly across the Sahara desert. Recently he flew as a passenger, over the same routes in the latest Air France equipment. His name, *Lucien Bossoutrot.*

The air trails the first international commercial pilot blazed are still being flown by Air France. Today, the World's Largest Airline is celebrating its 36th anniversary of service to the people of 76 countries. We salute Monsieur Bossoutrot, the aviation pioneer who began it all!

Aloft in the Farman Aerobus February 5, 1919

Lucien Bossoutrot as he appears today



Soon to fly across the Atlantic Super "G" Constellations.

HOW'S YOUR VOCABULARY?

Did you know that the words "PILOT," "NACELLE," "AILERON" are French contributions to the vocabulary of aviation?

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THE WORLD'S LARGEST AIRLINE

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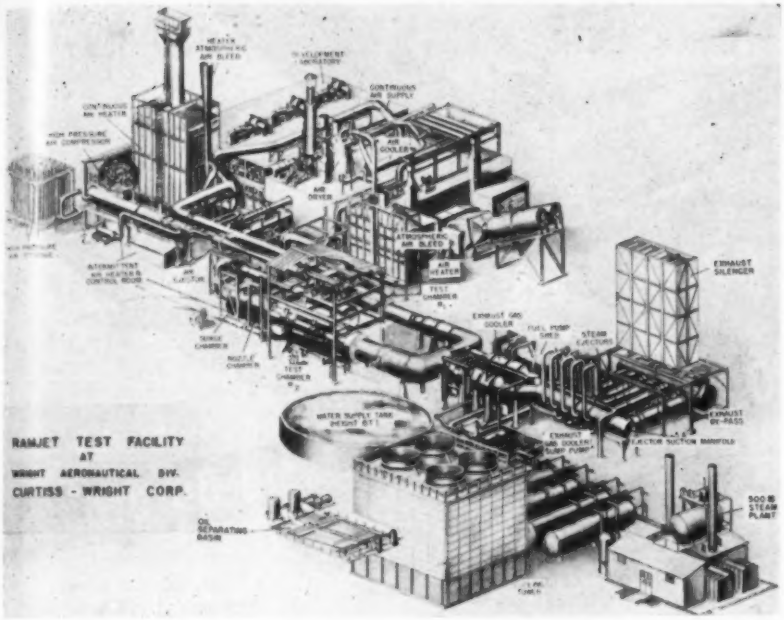

Curtiss-Wright Unveils New Ramjet Lab

Curtiss-Wright Corp.'s Wright Aeronautical Division has unveiled a new $7.7-million ramjet engine test facility said to be the largest privately-operated supersonic high-altitude laboratory of its type in the U. S.

The C-W installation, designed by company engineers and located at its Wood-Ridge, N. J. plant, is being built under U. S. Air Force sponsorship. It is situated immediately adjacent to the earlier ramjet lab completed in 1949 and the government-sponsored turbine development laboratory built in 1946.

However, the new installation is intended to supplement rather than replace these existing facilites, according to C-W president Roy T. Hurley.

• **Purpose of the new plant,** Hurley said, is to provide engineers with the resource needed to meet schedules for current ramjet development and production testing. For long-range programs in the field of supersonic flight, he said, C-W will continue to work with various government laboratories used in the past, as well as with new installations operated by the AF Air Research and Development Command.

Although little information was disclosed on the capacity of the new test stand because of its direct relationship with the rating of classified ramjets being built by C-W (such as one to power the North American SM-64 Navaho intercontinental missile) the company would release these details on the installation:

• **Test Stand**—New ramjet test stand is a tank 14 feet in diameter and 98 feet long, mounted on coil springs and anchored to a massive concrete footing. This compares with the older C-W test stand measuring 12 feet in diameter and 68 feet long which was limited in capacity to ramjets of about 50-inch diameter.

• **Air Nozzle**—The new installation is designed for both free-stream and ducted testing of ramjets. A major component is a 27-foot long supersonic nozzle of the variable Mach number type that can be changed from Mach 1.5 to higher speeds, presumably to numbers as high as the Mach 5 region generally associated with ramjets.

• **Noise Silencing.**—To silence engine noise and keep combustion temperatures (about 3,500F) from reaching the outside of the tank, the test chamber is water-jacketed over its entire length with water flowing between two one-inch thick steel shells.

• **Control Room**—Operation of new facility is so complex that the control room is designed for dual crew operation.

One crew is assigned to handle only the equipment controlling air flows, steam pressures and cooling system, while the other devotes full time to the engine on test and collection of performance data.

As an example of the recording job required of control room instrumentation, fuel pumps in the new lab are equipped to deliver 90,000 pounds of fuel per hour (15,000 gallons) compared with a 30,000-pound (6,000-gallon) per hour capacity in the older laboratory.

To handle this task one battery of recorders reads a total of 40 different temperatures within 20 seconds. Their recordings are produced in both written form and as punched cards that can be run directly into digital computers for data reduction.

As a result, C-W says, it is now possible to run variable fuel flow curves on a remjet engine under test in five minutes, whereas it once took ten times as long to compile similar type information.

• **Steam Flows**—When operated on a blow-down (near capacity) basis at high air flows, the laboratory uses steam at the rate of 2.1-million pounds per hour to simulate high-speed, high-altitude flights. For normal runs, steam consumption will be about 600,000 lbs. per hour, setting a time limit of 45 to 75 minutes before steam capacity limits test run duration.

• **Exhaust Cooling**—Exhaust gases leaving the ramjets are cooled by direct water spray to bring 3,500F exit temperatures down to about 800F within a few feet of travel. By the time the exhaust reaches the end of the gas cooler, temperature has dropped to about 100F.

Cooling water for this operation is drawn from a 2-million gallon reservoir tank located adjacent to the exhaust cooling system. Standing 73 feet high, it can deliver water to the laboratory at the rate of 30,000 gallons per minute.

• **High Pressure Air**—For normal laboratory operation, steady air flow is supplied by a compressor driven by three coupled electric motors that deliver a combined 17,000 horsepower. For substantially higher air pressures, a battery of air storage bottles supply 43,000 pounds of usable air at 3,200 psi pressure.

• **Air Heaters**—To simulate ramjet operation in supersonic flight at high altitudes, the new lab is fitted with three air heaters. Of these, an intermittent air heater 90 feet in length will raise the temperature of 70-degree air released from storage bottles to a uniform 800F in a fraction of a second.

• **Steam Ejectors**—For high altitude simulation, a series of nine steam ejectors serve to reduce pressure inside the test chamber by evacuation. For normal laboratory operation, four 24-inch diameter ejectors require 75,000 pounds of steam per hour.

As added capacity for blow-down runs, two 42-inch ejectors require 300,000 pounds of steam per hour, and three 48-inch units demand a 400,000 pound per hour steam supply.

"When I first saw the flying monkeys of Oz, I thought they were the greatest; but now I'd rather depend on a good standard make aircraft with its repair and overhaul in the hands of SPARTAN."

If you've been monkeying around having your work done wherever you happen to be when the need arises, we know you'll be happier at SPARTAN and you'll save money, too! Here, you'll find COMPLETE FACILITIES FOR REPAIR, OVERHAUL OR CONVERSION OF ANY AIRCRAFT . . . AT ONE CENTRAL LOCATION. In addition to the mammoth stocks of standard parts and equipment — always on hand — SPARTAN can fabricate, recondition or manufacture parts, thus eliminating delays. *Flat rate prices have been established for standard jobs.*

Ask for our new brochure which illustrates and describes our many facilities. A request on your company letterhead will bring a copy by return mail.

SPARTAN AIRCRAFT COMPANY

AVIATION SERVICE DIVISION

MUNICIPAL AIRPORT — TULSA, OKLAHOMA

Circle No. 34 on Reader Service Card.

West Coast Talk . . . By Fred S. Hunter

- **Delta Club is Exclusive Outfit**
- **Transocean Does Odd Repair Job**

IN strict social terms, the Delta Club may rate no space in the society columns of the San Diego Union. But it's certainly a select group. Exclusive, too.

W. C. Keller, engineer in Convair's military liaison office, organized it. The way to become a member is to check out on a delta wing. Then you are enrolled automatically and given a free lapel pin, compliments of Messrs. Keller and John Jay Hopkins.

Hunter

The company you'll keep in this club includes Air Force test pilots like Maj. Gen. Al Boyd, Brig. Gen. J. S. Holtoner, Lt. Col. Pete Everest and, of course, Maj. Chuck Yeager. Others are NACA's talented Scott Crossfield, Hughes Aircraft's Clarence Shoop and Bob De Haven and Convair's own "Sam" Shannon and "Skeets" Coleman. Yep, the Pogo, officially, is a delta wing, too.

• •

The things you have to do in this business. Transocean Air Lines, whose repair shop will tackle practically anything, recently set up a project to compute the precise measurements of every tunnel on the Southern Pacific Railroad from Ogden, Utah, to Oakland, Calif. Wanted to find out if it could ship a DC-4, which Resort Airlines had cracked up, on four flat cars the short way to Oakland. Worked out beautifully. The wing cleared one tunnel by exactly six inches. Transocean finished the big repair job (about $200,000) on time on a 120-day schedule and Resort had its DC-4 back in service at a minimum loss of time. It would be waiting yet however, if that wing had shifted just seven inches en route.

• •

Weights on a domestic configuration of the Douglas DC-8 jet transport run approximately like this: Maximum gross takeoff weight, 211,000 pounds; landing weight, 150,000 pounds; zero fuel weight, 133,500 pounds; operating empty weight 103,750 pounds; payload, 29,750 pounds. Seating configuration, 103, in 21 rows of triples and 20 rows of doubles.

• •

North American Aviation will be phasing out on the F-100A in August, but the line continues with two new fighter-bomber versions, the F-100C and the F-100D. Columbus division gets into the act as a second source on both of these. This still leaves one other version of the airplane, the F-107, which originally carried the F-100B tag. It's still down the line and will have a bigger engine than the J57, probably P&W's J75, possibly Wright's J67. The F-100I, or interceptor version, remains on the fire, with North American apparently still hopeful of Air Force action.

• •

Word trickles out of Burbank that there is a Model 1649B Super Constellation programmed, but Lockheed remains mum on it. Lockheed also keeps its silence on a jet pod rumor. This hints that the first 15 planes for Howard Hughes will be the Model 1649As, as announced, but that on the next 10 two turbojet engines will augment the four Wright EA2s to up the cruising speed of the thin-wing Super Connie to better than 400 mph. How does such an aircraft sound to you?

• •

Touring the Ames Aeronautical Laboratory on the occasion of NACA's recent triennial inspection, a vagrant thought kept coming to mind. Can the Russians possibly have research facilities of this magnitude? At any rate, it's comforting to know that we do.

• •

Lockheed Aircraft's Missile System division has two IBM Type 650, magnetic drum data calculators and Marquardt and Hughes have one each. They rent for about $3,800 a month . . . Douglas is equipping its A3Ds with Hydro-Aire's Hytrol anti-skid device to reduce tire wear and provide better control at landing fields, not for carrier operation . . . Art Kelly says Western Air Lines has over a thousand letters to prove that passengers like fancy service.

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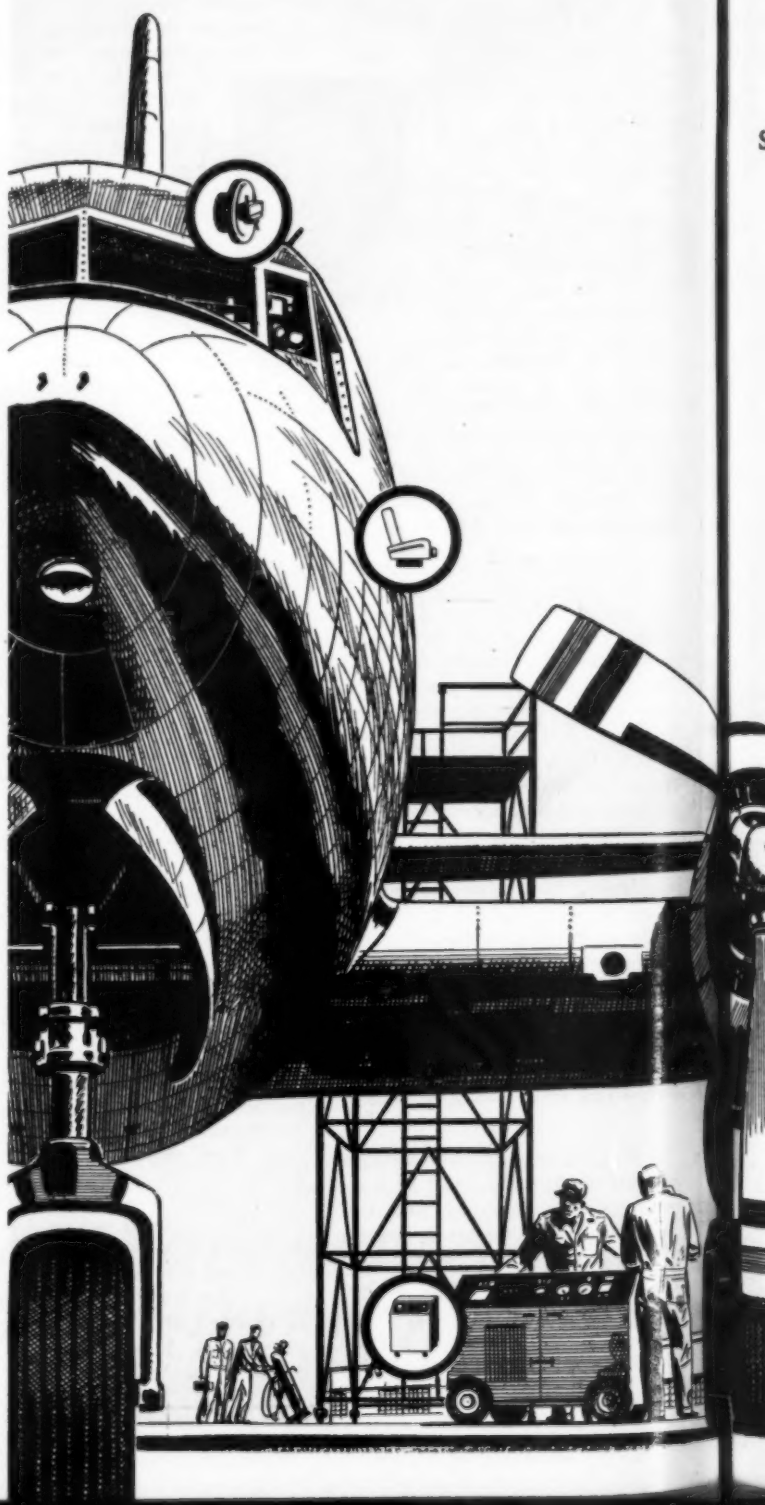

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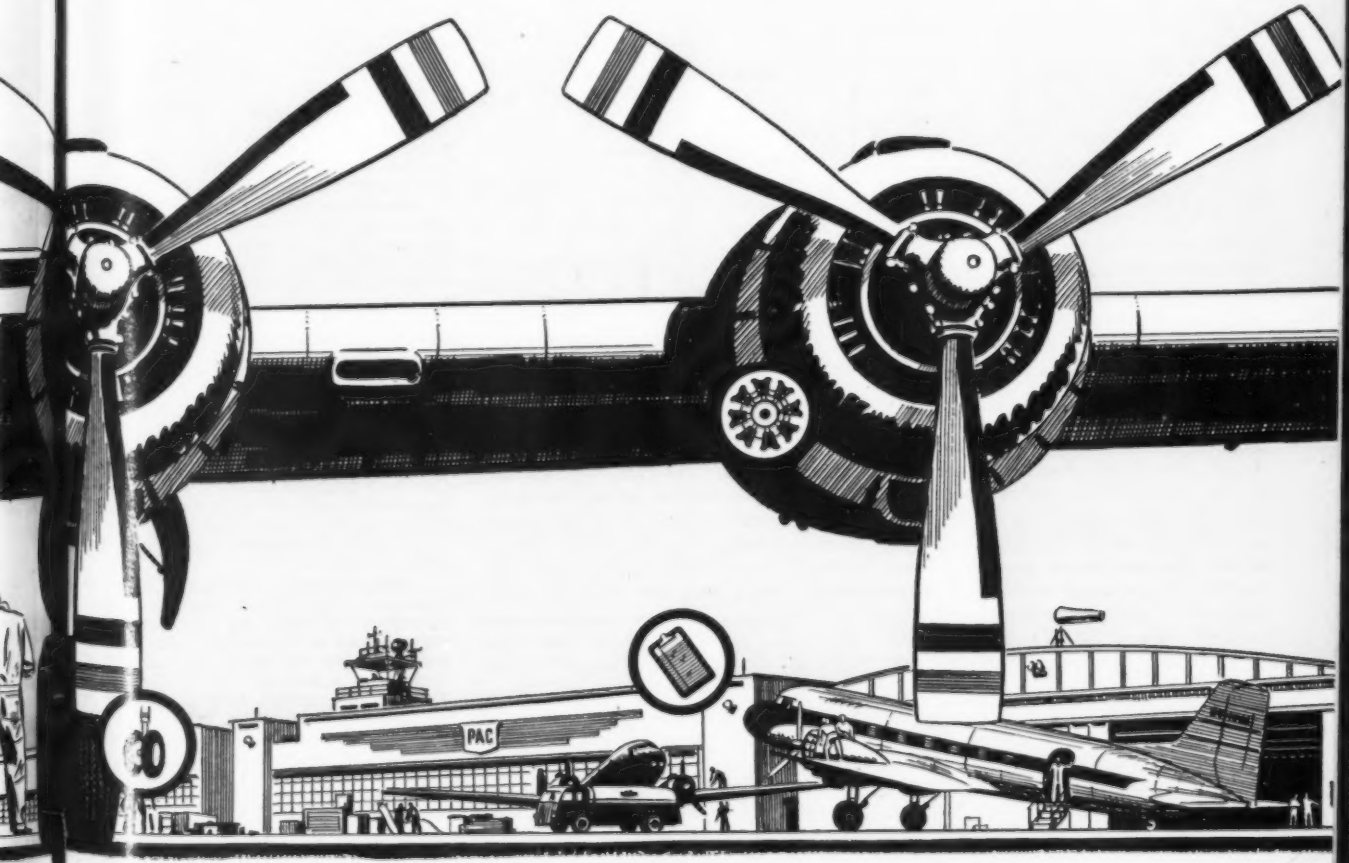

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7801

International Aviation

By Anthony Vandyk

A few weeks ago, one of Europe's most distinguished experts on international aviation matters, Professor D. Goedhuis, Dutch Civil Air Attache in London, stuck out his neck to make some predictions about U. S. aviation policy. He forecast that American aviation policy would lay growing emphasis on the removal of obstacles which so greatly hamper the healthy growth of world aviation.

He based this prediction on the following considerations: "In general, the economic policy of the present Administration is directed to widening and deepening the channels of trade. In this policy aviation is at the moment not yet included, but there can be no doubt . . . that it will be, for the simple reason that world aviation is a factor of ever growing importance in the recreation of a world market. Protectionism in aviation is incompatable with efforts toward the liberalization of trade."

Goedhuis went on to note that: ". . . even if the American national interest is considered merely in the narrow sense of the U. S. airline companies, a liberal policy can ultimately only be of advantage. In the last two years there has been a growing tendency in various countries to try to curtail U. S. air services.

"In a country wishing to operate services on a world-wide basis these tendencies are of course detrimental—but a nation, especially a nation whose airline industry is the strongest in the world, cannot expect other states to be liberal if its own attitude toward foreign air services is restrictive . . . The trait, ingrained in the American character, to find in freedom the strongest guarantee for prosperity, will, I believe, make itself growingly felt in the approach toward civil aviation problems."

Dr. Goedhuis' hopes were dashed last month when T. V. Kalijarvi, Deputy Secretary of State for Economic Affairs, gave a very succinct expose of U. S. civil aviation policy. He said: ". . . all route exchanges in international air transport are in the nature of horse trades. Let me assure you that there has been no exchange in which we have accepted a rabbit for a horse.

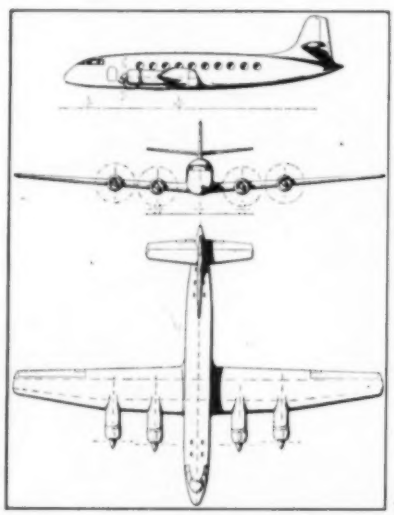
"If a foreign nation has an adequate number of points which the U. S. carriers wish to serve, to and through which our carriers feel they can profitably carry traffic, it is obvious that it may become necessary for the U. S. to grant rights to the major cities of the U. S. and beyond to Latin America. This does not mean that every foreign nation must be accorded equal rights. *Far from it—only those who have what we want and need should obtain comparable benefits.*"

Agusta-Zappata AZ-8 Design Details

GALLARATE, ITALY—Details of Italy's "DC-3 replacement" to be built here under Italian government contract by Costruzioni Aeronautiche Giovanni Agusta were given to AMERICAN AVIATION by the aircraft's designer, Filippo Zappata.

Known as the Agusta-Zappata AZ-8, the four-engine transport has simplicity and economy as its main features. It is to sell for about $250,000. Work is about to start on the prototype for the Italian government and it should fly in about a year's time.

Zappata, who has designed a large number of well-known Italian aircraft



including the big BZ308 four-engine intercontinental transport, believes that there is a big market for a four-engine transport with a payload slightly bigger than that of the de Havilland Heron. The AZ-8 accommodates up to 22 passengers with each seat by a window.

• **Zappata estimates** that the operating cost of the AZ-8 will be lower than that of the Heron for stages of over 250 miles. Its most economic stage length will be between 310 and 560 miles. Maximum range will be 1,250 miles. Normal cruising speed will be about 230 mph. Normal payload will be about 8,000 lbs.

The AZ-8 will be powered by four French-built Potez 8D30 engines of 500 hp take-off power. An alternate version, the AZ-8L, will be available with four British-manufactured 560-hp Alvis Leonides powerplants. Apart from a commercial transport, the AZ-8 is designed for use in several different roles: military or police transport; ambulance aircraft; paratroop transport; trainer. In all versions the following characteristics and performance remain constant: gross weight, 24,500 lbs.; max. payload, 5300 lbs.; length, 62 ft.; span 84 ft.; cabin volumetric capacity, 882 cu. ft.; max. width of fuselage 5.9 ft.

Transport Briefs

Scandinavian Airlines System has increased its DC-7C order from eight to 14 aircraft for a total of $42 million; deliveries will start in 1956 . . . **Philippine Air Lines**, on the advice of the Philippine government, has declined the offer of PAA to invest $1 million in the company . . . **El Al Israel Airlines** has now formally signed a contract to buy three Britannia 300LR turboprop transports with an option on two more . . . **Air Ceylon** reportedly plans to start operations to Calcutta, Rangoon, Bangkok and Singapore and may acquire Convairs and four-engine Handley Page transports for this expansion program . . . **Canadian Pacific Airlines** may switch the last four of the eight DC-6Bs it has on order to DC-7Cs . . . **Air-India International** has ordered an additional Super Constellation—a Model 1049G for 1956 delivery.

Transportes Aereos Portugueses will probably be designated by the Portuguese government to operate a route linking Lisbon with Goa, Portugal's possession on the Indian subcontinent . . . **Indamar Airlines**, Indian nonsked, has registered four of its DC-3s in Afghanistan and will operate freight services to the Middle East under contract to the Afghan government . . .

Manufacturing Briefs

The cooled turbine of the 4200-hp Napier Eland 5 has done several hundred hours on component test rig development; the engine itself is expected to go on the bench this year . . . **A. V. Roe Canada** is buying out Canadian Car & Foundry Ltd. . . . The **Vickers-Supermarine** 525 naval fighter has flown with boundary layer flap control . . . Australia's Avon Sabres are to be armed with rockets.

Rolls-Royce is expected to offer two versions of its RB-109 twin-spool axial turboprop: a 2500 shp constant-power engine and a developed unit giving 5,000 shp for sea-level take-off under temperate conditions . . . Germany's **Focke-Wulf** aircraft firm is said to be seeking to merge with a smaller aircraft company (whose facilities escaped war damage) to get back into warplane production . . . **Bristol** is to build the **SNECMA** reverse thrust device under license.

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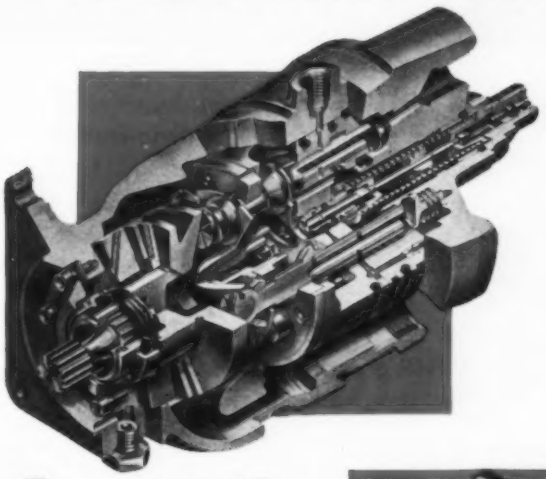

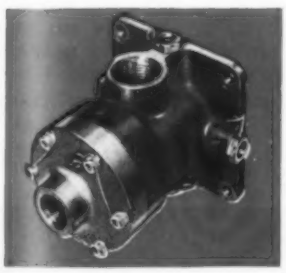

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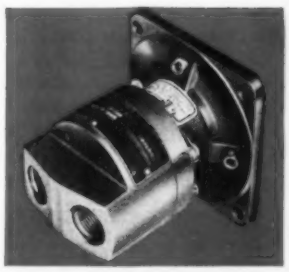

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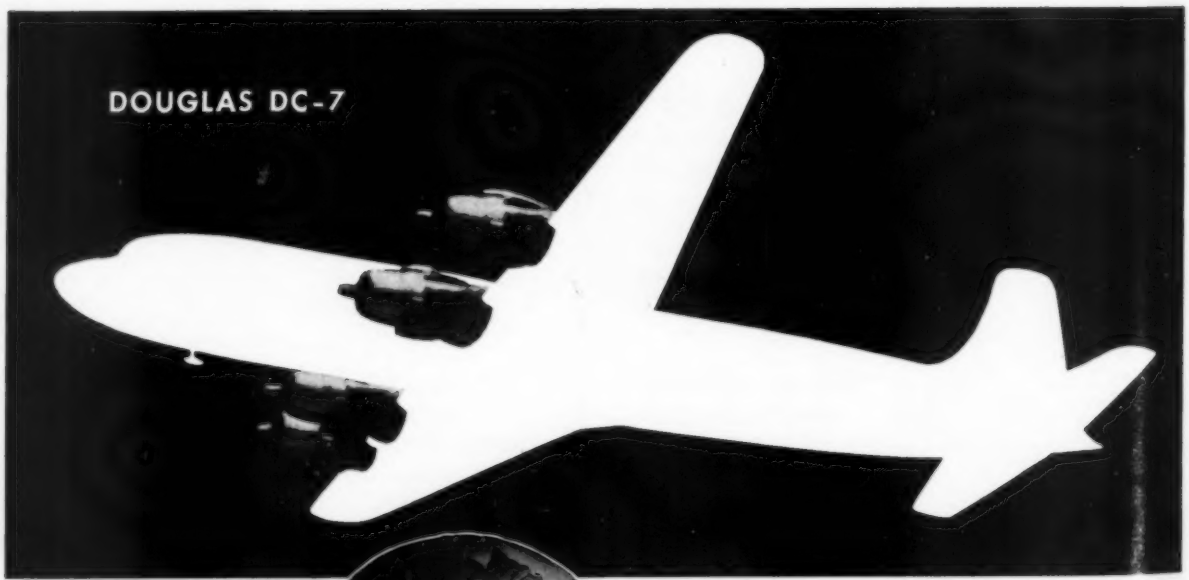

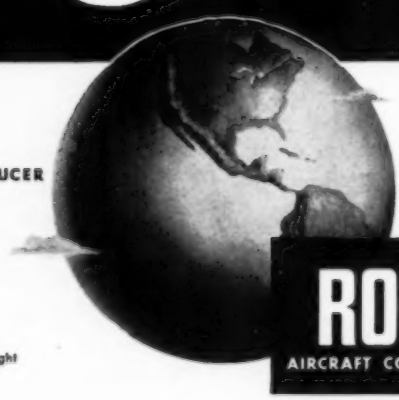

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Leaders Urge ADMA to Plan 10 Years Ahead

By LOIS C. PHILMUS

Breezy Point, Minn.—More than 160 distributors and manufacturers of parts and equipment and guests gathered here last month for the 25th meeting of the Aviation Distributors and Manufacturers Association. Principal speakers, in turn, blasted the group for lethargy in selling aviation; urged preparation for the next 10 years, and found that certain circles were impeding air traffic control progress.

Donald W. Nyrop, president of Northwest Airlines, told the group that "it isn't enough for us just to keep abreast of the times—we must be several jumps ahead. The most practical way to arrive at the future answers is to project into the future certain factors whose course has been definitely charted in the past."

Citing predictions for the overall national economy in 1965, he urged the members to follow the airlines by "preparing long-range projections for your businesses."

"By so doing," he said, "we will be able to make maximum progress by 1960 and 1965."

Nyrop said NWA had its equipment purchase programs completed through December 1, 1957 and has projected its aircraft requirements for 1958, 1959 and 1960. "Orders will be placed at appropriate times for these airplanes," he added.

Henry W. Boggess, president of the National Business Aircraft Association, found that "the recent attempt to scuttle the CAA program of DME is an outstanding example of an action to confound and impede rather than to help solve air traffic control problems."

It is a sad commentary on the industry, as well as a serious impediment to progress, Boggess said, to find that "there are those within the civilian ranks of aviation whose attitudes tend to thwart progress in air traffic control.

"It seems incredible that anyone professing to espouse the cause of aviation could clamor for the death of VOR/DME at the same time admitting that anywhere from three to ten years will elapse before another dream-stage system, TACAN or otherwise, can be perfected and implemented to take its place," he added.

Boggess warned that a recent AF request to clarify the Civil Aeronautics Act to denote that no civil agency would have "statutory authority to interfere in purely military aviation matters" in air navigation and facilities, "could be tantamount to grounding 60,000 civilian airplanes."

Dwight P. Joyce, chairman and president of The Glidden Company, accused the group of being "so engrossed in making money or trying to make money out of selling airplanes, parts and supplies that they have lost sight of the fundamental activity that makes their business possible."

Joyce said that what "we actually are selling, or should be, is the promotion of civilian flying in all its aspects. I frankly feel that civilian flying (with the exception of crop dusting activities and airline operations) has not made the sound progress it should have made in the 10-year period since the end of World War II. I believe that much of the blame for this can be laid squarely on the doorsteps of you men. . ."

"In some instances," he said, "you have devoted your energies to petty squabbles and competitive price warfare among yourselves, endeavoring to selfishly capture a larger portion of the pitifully small market, instead of working together and with other components of the industry in the fruitful activity of expanding that market."

Joyce expressed the opinion that the utility of the airplane is being oversold and that private and sport flying should be vigorously promoted.

"Utility factors have often been exaggerated and overemphasized," he said. He observed that business planes in many cases perform a real economic function, but added "there are a number of so-called business aircraft performing no real economic function at all and are used primarily to transport executives to and from resorts, or on business trips where commercial airlines can do the job better and cheaper."

Thomas A. Fernley, Jr., executive director of ADMA, urged the manufacturers to "survey the problems of their distributors to see that they are adequately compensated for the services they are rendering."

He noted that, from a high point of 6.31% in 1951, the before taxes net profit declined to 3.77% last year. In 1951, the after taxes net profit was 3.96% and in 1954 it was down to 2.43%.

"Now a considerable amount of this reduction is due to the fact that the gross margin for 1954 is the lowest since we began to compile figures in 1946," he stated. "The average is 24.56%, a reduction of over 1% from the 1953 figure. On the other hand, our members are operating on an efficient basis with their overhead expenses in 1954 being 20.79%, the second lowest figure in the last nine years."

On the problem of whether a distributor should have a service organization, C. W. Baker of The National Screw & Manufacturing Co. found it unnecessary for his products. But for technical products, G. F. Quinby of Narco stated that it was the distributor who was responsible for product maintenance for his customers.

Defining the distributor as "an agent for the manufacturer responsible for the successful transfer of the manufacturer's product to the market," Quinby said that the distributor must more than just sell a product. He must provide service or product maintenance in order to insure the customer's return and to insure his recommendation to potential customers on both the product and distributor.

An informal survey among the manufacturers about another knotty problem was undertaken—whether or not a distributor should handle sales to airframe manufacturers and airlines. A show of hands among the manufacturers indicated that more than 90% handled such transactions directly, with only four manufacturers using distributors. Basic reason appeared to be the distributors' inability to provide the necessary service, know-how and maintenance.

DONALD W. NYROP, president of Northwest Airlines, chats with ADMA officials in Breezy Point, Minn., prior to delivering his address to the association's 25th meeting. Shown are (left to right) James Riddle, ADMA president, G. B. Van Dusen, vice chairman of the reception committee, Nyrop, and George Galipeau, vice president, Van Dusen Aircraft Supplies, Inc.

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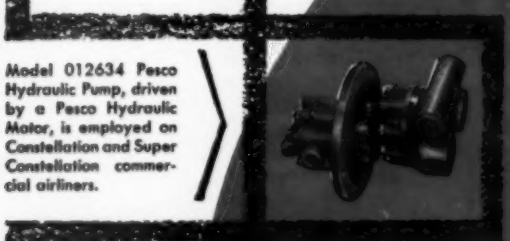
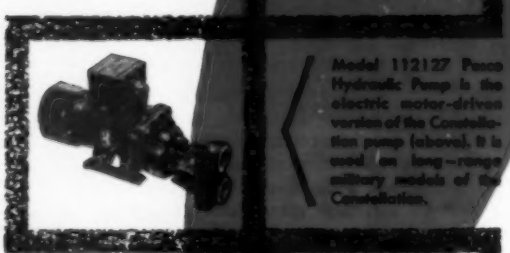
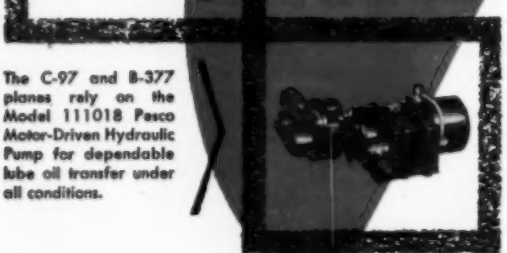


Model 012634 Pesco Hydraulic Pump, driven by a Pesco Hydraulic Motor, is employed on Constellation and Super Constellation commercial airliners.



Model 112127 Pesco Hydraulic Pump is the electric motor-driven version of the Constellation pump (above). It is used on long-range military models of the Constellation.



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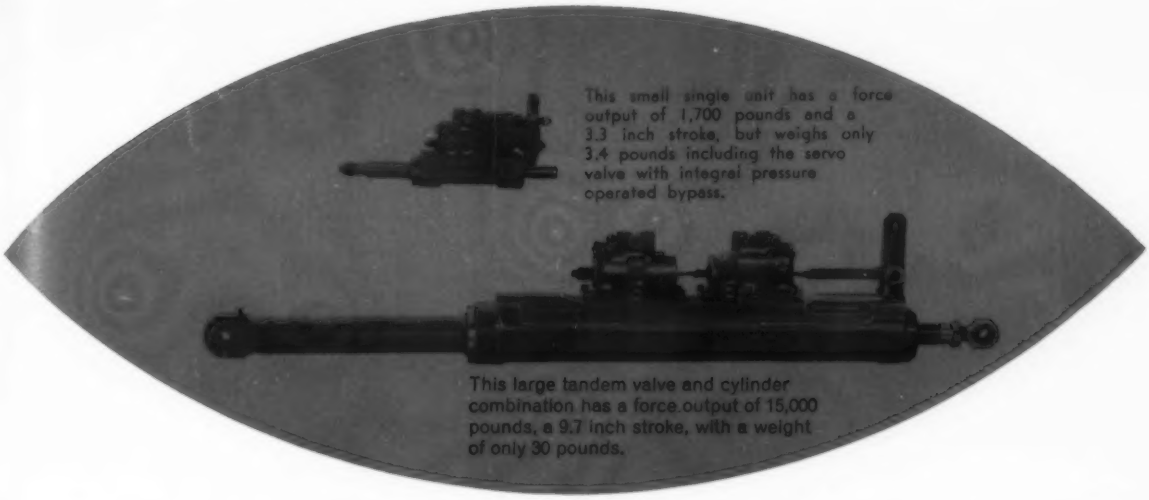

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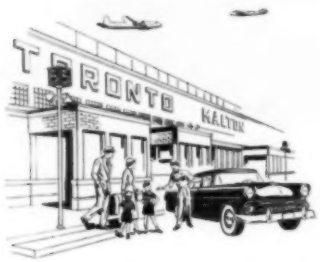

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TRANSPORT TRENDS

Washington, D. C., July 18, 1955

PRESSURES BEING APPLIED within the Executive Department show promise of giving Civil Aeronautics Board Chairman Ross Rizley's "clean shop" administration the acid test. At least two cabinet officials are now actively concerned with the revived feud between Pan American World Airways and W. R. Grace Co.

In another instance, a one-time executive assistant to a present high-level White House official appeared in Washington recently to inquire about CAB revocation of North American Airlines' certificate. White House had been briefed on the North American situation some time ago but adopted a firm hands-off policy at the time.

RECENTLY SIGNED U.S. GERMAN bilateral air transport agreement continues to draw Congressional criticism, particularly from the Senate Commerce Committee. Sen. Warren Magnuson, (D-Wash.) who heads that group, contends that the "full consideration" which CAB and State officials say they gave the case is contrary to testimony of U. S. carriers before his committee.

Equally critical of the pact was Committee member, Sen. George A. Smathers, (D-Fla.) who termed it detrimental to the welfare of our domestic airlines and our Latin American relations. Smathers said it was signed contrary to the expressed opinions of the majority of Committee members and is "like swapping an apple for an orchard."

ORDERS FOR SIKORSKY'S 12-PASSENGER S-58 helicopter are expected momentarily. New York Airways and SABENA Belgian Airlines have been evaluating both S-58 and Piasecki's 21-passenger H-21 twin-rotor transport. S-58 is powered by a single Wright R1820 engine and is reportedly priced at $250,000.

JACK FRYE, FORMER TWA PRESIDENT, has formed The Frye Corp., an aircraft manufacturing firm to be located in the southwest. One major project will involve design and production of a four-engine, short-haul, "workhorse" transport for small airfield operation.

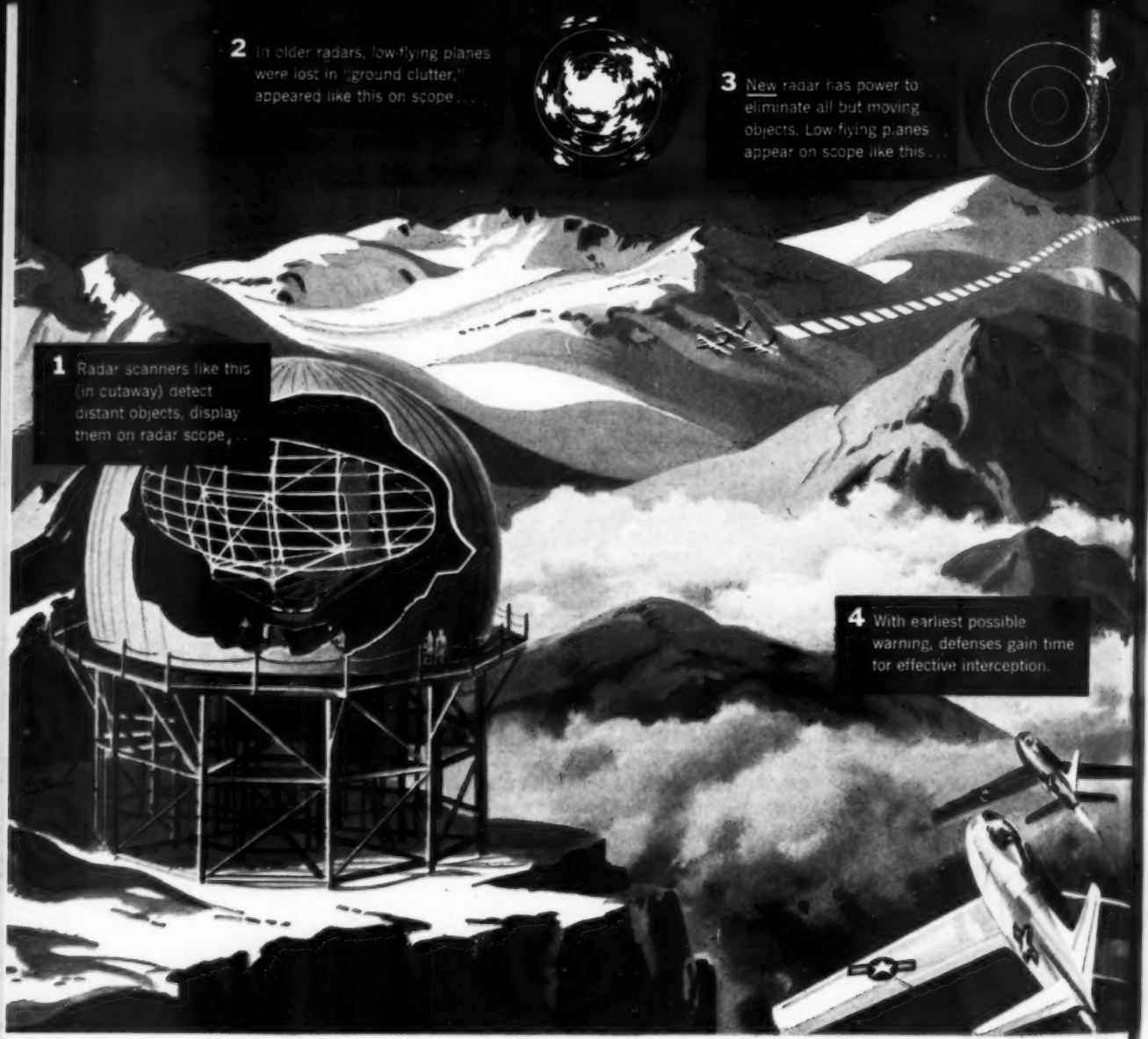
POSSIBLE FORMATION OF A EUROPEAN COMPANY that would buy big expensive transports in the Douglas DC-8 category and lease them to foreign operators is now in the discussion stages. Activity would be slanted at smaller airlines requiring six or fewer planes who usually have trouble convincing stockholders on financing of maintenance facilities for small fleet operation. A similar European organization called SOFIMA is now set up to handle purchase and lease of railroad equipment.

TRANSCONTINENTAL AIRLINE FLIGHTS in less than two hours may be possible within the next 10 years or less, two industry officials predict. Lockheed's chief engineer C. L. "Kelly" Johnson says that a "pure drawing board dream" transport of the future would have a block speed exceeding 1,200 mph and fly from Chicago to Los Angeles in one hour and 23 minutes.

Dan A. Kimball, president of Aerojet-General Corp., says his engineers are exploring a hybrid-type rocket transport that could fly coast-to-coast in about an hour and a half at altitudes of about 80,000 feet.

TEMPORARY CERTIFICATE OF TRANS-PACIFIC AIRLINES for operations in the Hawaiian Islands has been renewed by CAB through December 31, 1959. Board's unanimous 5-0 decision was approved by President Eisenhower July 11.

In continuing a two-carrier network in the Islands, the Board said the cornerstone of its decision is the imperative need for competitive air service in the Hawaiian Islands. If it were not to renew Trans-Pacific's service, CAB added, Hawaiian Airlines would obtain a complete monopoly position, a result it regards as contrary to the basic tenets of the Civil Aeronautics Act.



NEW POWER SOURCE TIGHTENS RADAR DEFENSES

Million-Watt Klystrons Aid Detection of Distant, Low-Flying Planes

THE STORY BEHIND THE STORY:

What is the significance of the headline above? To borrow from an old baseball expression, *"You can't hit 'em if you can't see 'em"*— approaching planes that formerly evaded radar detection can now be "seen" at greater distances than ever before.

■ Behind this improved radar vision is a new family of high power tubes known as Megawatt Klystrons. These new tubes not only provide greater ability for beaming radar impulses against small

improvement to a technique known as M.T.I. or Moving Target Indication. In radars without M.T.I. everything within the beam of the radar appears on the viewing scope. Images from trees, terrain, buildings, all combine to form "ground clutter" on the scope. M.T.I. eliminates this "ground clutter" by indicating moving objects only. Therefore with Megawatt Klystrons, approaching aircraft can be spotted sooner and defenses can be alerted more quickly.

■ Producing millions of watts of electronic power, these giant tubes make

with radar impulses at greater distances to provide clear, sharp images on the radar scope. Furthermore, the Megawatt Klystron's stable performance and long life assure that these radar sentries are constantly on guard.

■ The Klystron tube made microwave radar possible. Developed by Sperry, it generates, amplifies or multiplies microwaves. Today, Sperry produces Klystrons covering a wide range of powers and frequencies for specific requirements – both military and industrial. To meet demands for these tubes, a new plant has just been opened devoted exclusively to Klystron research and production.

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TRANSPORT AVIATION

CAB Orders Largest Nonsked Grounded

- **North American Airlines group found guilty of "willful" violations, must end activities Sept. 1.**
- **Companies plan appeal to courts, say Board's action has "little practical effect."**

By WILLIAM V. HENZEY

THE Civil Aeronautics Board this month ordered the North American Airlines nonscheduled group of carriers to terminate all operations at 12:01 a.m., September 1. The order was expected to be challenged in the courts by North American which, among other things, will seek to stay the termination date.

CAB found the so-called "combine" to be guilty of "willful and knowing violations." A four-man majority said "it is perfectly clear that the respondents have attempted to make a mockery of the Board's regulations and to operate without regard to the requirements of the . . . Act."

Vice Chairman Joseph P. Adams concurred with findings of violations of the regulations but opposed the "drastic sanction of outright revocation."

• **A North American official** said "obviously we are the victim of a grudge for flying too many people too regularly, too cheaply and without subsidy." He said the Board's action "has little practical effect." "We are certain that the courts will intervene to prevent the board from carrying out this vindictive and prejudicial action."

But the CAB majority, composed of Chairman Rizley and Members Gurney, Denny and Lee, said it had little alternative but to impose the revocation sanction. "It would be unthinkable," they said, "to allow these respondents, or any other private parties, to take matters into their own hands, and have us condone such action. The plain fact is that Congress has enjoined anyone from engaging in air transportation without a certificate . . . or other appropriate operating authority from the Board.

"Respondents have flagrantly and wilfully ignored the statutory plan. Unless and until the Board alters the regulations here involved, or the Congress directs a new policy, we are duty bound to preserve the integrity of our processes, and the statutory plan that has been entrusted to us for administration. After all, Congress has delegated to this Board, and not to respondents, the administration of the Civil Aeronautics Act."

• **Nonscheduled airlines** faced with revocation under the order are Twentieth Century, Trans National, Trans American, and Hemisphere Air Transport. Board also found Stanley D. Weiss, James Fischgrund, Jack B. Lewin and R. R. Hart to have operated through various partnerships and corporations and "pursuant to a calculated plan to evade and circumvent the law." They were ordered to cease and desist from further violations.

In addition to violations as to frequency of operations, ticketing irregularities, etc. the group basically was found "through their combined activities, to have constituted a single integrated air carrier which operated as a partnership or joint venture and engaged in regular air transportation, without a certificate . . . or other appropriate operating authority, all in violation of Section 401(a) of the Act."

Aside from expected future court action, the Board's action climaxed a lengthy proceeding initiated several years ago by CAB's Office of Compliance. Hearings were held in major cities from coast-to-coast and were alive with court battles which, at one point, held up the hearings for one year.

Chief prosecutors for the compliance office were attorneys Robert M.

SCOTTISH AVIATION'S Twin Pioneer 16-passenger transport made its first flight late last month. The plane was built from production jigs and tools from which production models already are in the early stages of assembly. Powered by two Alvis Leonides radials, the Twin Pioneer is designed for "bush" type operations. It is capable to taking off and landing in extremely short distances. Manufacturer is Scottish Aviation, Ltd., Prestwick, Scotland.

Johnson and John F. Wright. The case was heard by Examiner William F. Cusick who earlier this year recommended revocation of the North American letters of registration.

• **The series of legal maneuvers** characteristic of the proceeding throughout were evident even on the day CAB issued its final decision. At 10:48 a.m., July 1, North American filed a motion to disqualify Member Harmar D. Denny from participation in the case.

Actually, Denny had participated in the case which, prior to the North American motion, was scheduled for final release at 11 a.m., July 1.

Gist of the motion was an affidavit signed by Laurance Henderson, North American official, stating that Denny, through statements dating back to February, 1954, was "biased and prejudiced against respondents and is not judicially competent, capable or qualified to discuss or consider" the case.

• **Denny allegedly** had told Henderson and others on occasion that North American's safety record bothered him.

One statement quoted was "The fact they (North American) have not had an accident is only an accident."

CAB, however, thought the motion "untimely" and concluded that the charges "failed to establish any sound basis for excluding Member Denny from participation in this proceeding."

Adams, meanwhile, in his opinion, agreed that some "drastic sanction" is in order, "but I do not agree that the only proper sanction in this case is revocation . . ."

• **Adams emphasized** that his basic difference with the majority is "one of long standing which transcends this particular enforcement action."

"I am convinced," he continued, "that considerations of both airline service and airline prices to the traveling public should persuade this Board to settle this enforcement case on some terms short of outright revocation. . . . I base this conviction upon the benefits to the traveling public which have resulted from their providing a needed competitive spur to our certificated trunklines in offering coach service to the public at low fares.

"For their willful violations, the carrier should be penalized, but it does not follow, to my mind, that North American should be completely eliminated from the low fare non-scheduled airline industry." • • •

Braniff, EAL Await CAB Approval

Braniff Airways and Eastern Air Lines were awaiting early CAB approval at presstime of a New York-Miami-Latin America interchange agreement.

However, a series of agreements filed by various combinations of the Pan American, National, and Panagra interests failed to add up to the other interchange service called for by CAB in its April 20 decision in the New York-Balboa Case.

Specifically lacking was agreement between Panagra's co-owners, Pan American and W. R. Grace & Co. Each reached terms with National and separate agreements to that effect were filed with CAB before the July 1 deadline set by the Board.

But Pan Am, which had been accused earlier by Grace of dragging its feet in arranging an interchange, told CAB it had "met with an obstacle" in complying with terms of CAB's decision.

Said Wilbur Morrison, PAA's exec. v.p.: "The President of W. R. Grace & Co., who is not an officer or director of Panagra, has taken the arbitrary stand that, so far as Grace is concerned, the interchange agreement must be limited to Panagra and National, completely disregarding Pan Am as the intermediate carrier . . ."

The interchange contemplated by CAB would utilize National's route between New York and Miami, Pan Am's route between Miami and Balboa (which is operated by Panagra under a trackage agreement), and Panagra's route south of Balboa.

Attorneys indicate that to accomplish such a singleplane operation it is necessary to have signatures of all three carriers on one agreement. PAA has submitted a "proposed agreement" for the three carriers and has asked CAB to "reaffirm that all three companies . . . must be parties to the interchange agreement."

There is also the possibility that CAB will issue an order immediately approving the Eastern-Braniff service which, aside from public benefits, would conceivably serve as a competitive spur to the other carriers.

CAB Examiner Approves Independents' Proposals

A CAB Examiner has recommended approval for three years of proposals of two independent air carrier associations under which each organization would act as a clearing house for commercial charter operations.

Proposals were advanced by Aircoach Transport Association, representing 30 non-scheduled airlines, and Independent Military Air Transport Association, representing a mixture of all-cargo and irregular carriers.

Each group has used the clearing house or air exchange idea in arranging military charter operations in the past. They would now put the practice into effect for handling of commercial charter business.

Examiner Paul N. Pfeiffer said the plans would, if anything, "intensify competition" among non-scheduled airlines and would "intensify healthy price competition between the irregulars and scheduled operators, thereby acting as a brake on rising fare and rate levels of all airline services."

Both passenger and cargo services are included in the proposals.

NEW HELICOPTER ROUTE of Belgian World Airline, from Brussels to Eindhoven, Holland, and Duisburg, Germany, was inaugurated by flight of five Sabena S-55 'copters, three of which are shown in triangular formation.

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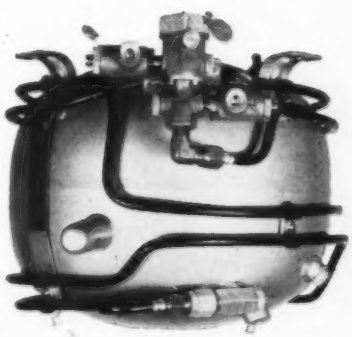

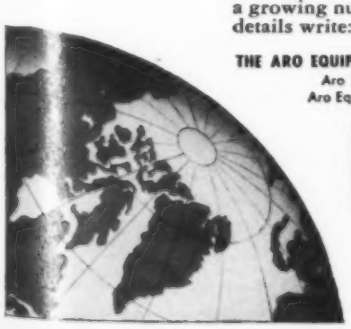

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Qantas Gets New Chief, Buys New Connies

Qantas Empire Airways, one of the few government-owned airlines paying its own way, this month found itself with a new chief executive officer and a new stable of aircraft on the way.

Sir Hudson Fysh, one of the three founders of the Australian carrier and one of the world's best known aviation figures, turned reins of the airline over to another Qantas veteran, 48-year-old Cedric O. Turner, formerly general manager. Sir Hudson, however, continues as chairman of the board.

At the same time, it was announced that the Australian global airline had ordered a new version of the Lockheed Super Constellation, the 1049H, a transport that can be used either as a heavy-duty cargo hauler or a luxury passenger liner.

• **In its 35-year history** Qantas has shown a profit every year and today has an annual revenue of $32 million, with an average $1-million profit after paying half a million in taxes to the Commonwealth.

The airline is Australia's 14th largest industry in terms of shareholders' funds and employs 5,000. It is the world's fifth largest international airline in terms of unduplicated route mileage, 62,607.

Qantas also is in the process of constructing a $2.5-million executive office building and a $1-million hangar in Sydney.

In taking over his new position as executive head of the airline, Turner said: "It is my aim to keep Qantas expanding globally in the service of Australia, but always standing on its own financial feet. These are the principles that have guided Sir Hudson Fysh."

Cedric O. Turner

Sir Hudson Fysh

• **He believes** commercial aviation will not be doing its real job for society until it provides low-cost mass transportation. The turbine-powered aircraft, he argues, can bring today's $780 Sydney-London fare down to or below $500.

Among his accomplishments as general manager were expansion of the company's routes to South Africa, and absorbing the route of British Commonwealth Pacific Airlines last year when that company was liquidated. With the latter, Qantas for the first time began operations into the U. S. at San Francisco, and into Canada at Vancouver, B. C.

Turner was responsible for the financing that made possible re-equipping the Qantas fleet with 12 Super Constellations valued at $34 million, plus the two new 1049Hs that will be delivered next year.

• **Qantas is selling** its six 749 Connies for $11,250,000; liquidation of BCPA yielded $4.5 million; and the company will get $15,750,000 from revenues and short-term bank finance.

This left $2,250,000, which shareholders paid to bring capital up to $11,250,000.

Thus Qantas, owned 100% by the Australian government, has not had to ask parliament for aid in re-equipping.

The company believes in doing things for itself: It operates its own hotel in Sydney (the Wentworth), a frozen food factory, a self-contained

NEWEST SUPER CONNIE is the 1049H, a quick change cargo-passenger version, two of which have been ordered by Qantas.

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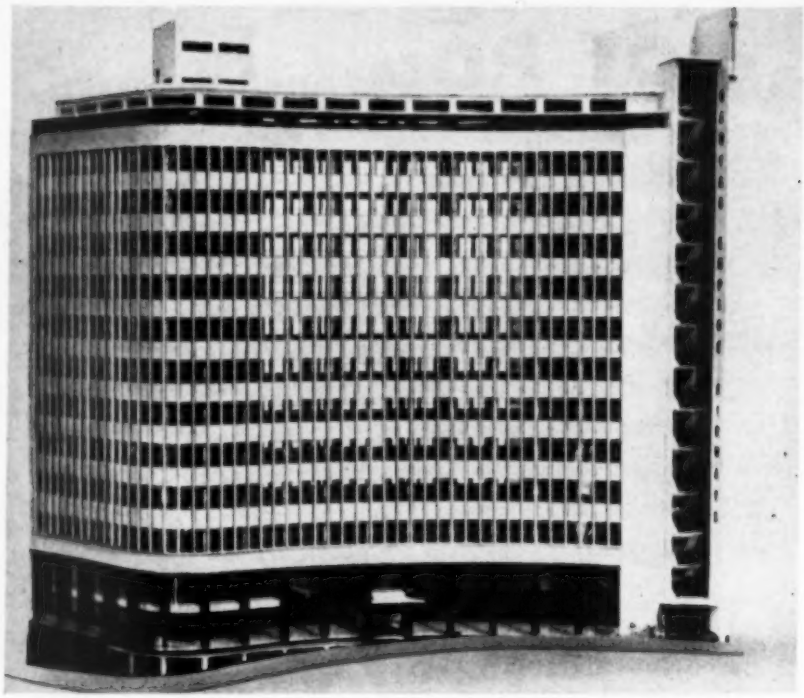
—U.S. Supreme Court



QANTAS' NEW OFFICE building under construction at Sydney. Cost: $2.5 million.

printing plant and a tropical type hotel in Darwin.

• **Sir Hudson and two others** founded Queensland and North Territory Aerial Services Ltd. (from which Qantas derives its name) shortly after World War I, in which he served as a pilot. Since then, the airline has used 38 types of planes.

Another type will be added with delivery of the 1049H, which can be changed quickly from a cargo transport to a 92-passenger airliner. It has an 83-ft. long main cabin and two lower compartments provide 5,569 cu. ft. of stowage space.

The 1049H, 22nd version in the Super Constellation series, is a separate design from the 1049G and the recently announced 1649A. It has an extruded magnesium floor and a maximum gross takeoff weight of 137,500 lbs.

Fitted with tiptanks of 600 gallons each, the cargo version carries enough fuel to fly 4,540 miles with a three-hour reserve. Top speed exceeds 370 mph, with 335 mph maximum cruise speed. Engines are Wright Turbo Compounds.

More Transport Orders Coming Up

Despite the absence of a follow-up order by any airline since American Airlines' purchase of the Lockheed Electra turboprop (AMERICAN AVIATION, June 20), all signs still point to an early wave of new equipment buying. It encompasses both jets and turboprops.

• **National Airlines president** G. T. Baker has disclosed his airline's $95-million fleet and facilities expansion program involving both aircraft types. Equipment details, he said, will be made known as soon as confirmed within the next few weeks.

• **Final Eastern Air Lines'** decision on whether to buy the Lockheed Electra was expected at presstime. Lockheed's present program calls for output at the rate of 132 per year by late 1959.

• **Speculation continues** to run high that the decision of Douglas Aircraft Co. to proceed with DC-8 jet production may soon be rewarded with orders totaling at least $300 million. Said to be in negotiation, if not in the signing stage, is a 25-plane order by Pan American World Airways and Panagra; orders by both American Airlines and United for initial quantities of 10 to 15 aircraft each, and orders from Eastern, National and Braniff for four each.

These orders, should they materialize, would number about 60 DC-8 jets. With the price per airplane, plus spare parts, expected to hit $5 million, they would give Douglas a $300-million boost for its jet transport production.

New Mail Rates Seen For Local Airlines

New service mail rates for the nation's 13 local service airlines were called for by the Civil Aeronautics Board recently in a move made inevitable since establishment of a new service rate structure for the domestic trunk industry.

Rates which the Post Office pay local carriers for mail service are traditionally based on costs and rates of the larger trunk lines. Present local rates range from 75¢ to $2.58 per ton-mile. These were based on the old 45¢ structure of the Big Four that recently was reduced to an average of 37¢ by the CAB. A corresponding reduction for the locals can be expected.

However, since all locals are subsidized, the move will result in no change in over-all mail pay to those carriers. It will simply mean that whatever reduction is made in service pay will be accounted for through an increase in subsidy to maintain the same total pay.

Also, only a small amount of money will be involved since but $1.3 million of the $26.4 million total mail pay bill for fiscal 1956 is for service pay.

Little Black Box

Tension breaker in the long, and sometimes bitter, TACAN/VOR-DME dispute was offered by NARCO at last month's Aviation Distributors and Manufacturers Association 25th meeting in the form of Endital, "a new revolutionary pilot navigation aid."

The gag served to lighten the meeting considerably and provided the worried users and distributors with a laugh reprieve. NARCO's "black box" was billed as being "hardly bigger than a cigaret pack. Distance and course are shown in two speedometer-type indicators." Using two transistors, "center output light blinks when destination is reached while four lower buttons control function desired. Unit also includes automatic pilot, automatic approach coupler, radar and a 4,600-channel transmitter." The "official release" concluded that "based on the number of tubes involved, the price should not exceed $25."

A needle aimed at TACAN's still classified state barbed: "Complete details on the inner workings of Endital cannot be disclosed at this time because of security reasons so far not determined."

"NEW LOOK" in JET VTO Plane Design

Ryan test pilots and engineers are embarking on one of the most exciting... most unusual aeronautical projects ever conceived. Behind these gates, a new, all-jet Ryan vertical take-off airplane is under development for the Air Force. The results hold promise of being as revolutionary as aviation's change from propeller-driven aircraft to jet power.

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The new "Electra" fleet for American Airlines will improve air transportation and strengthen United States air power.

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31 CONSECUTIVE ISSUES
Sperry Gyroscope Co.

27 CONSECUTIVE ISSUES
McDonnell Aircraft Corp.

26 CONSECUTIVE ISSUES
Pioneer Parachute Co., Inc.

25 CONSECUTIVE ISSUES
Fairchild Aircraft Division
General Electric Co.

23 CONSECUTIVE ISSUES
Reeves Brothers, Inc.

22 CONSECUTIVE ISSUES
Flightex Fabrics, Inc.
Parker & Co.
Sinclair Refining Co.

19 CONSECUTIVE ISSUES
Goodyear Tire & Rubber Co.

18 CONSECUTIVE ISSUES
Elastic Stop Nut Corp. of America

17 CONSECUTIVE ISSUES
Michigan Seamless Tube Co.

16 CONSECUTIVE ISSUES
Eclipse-Pioneer Division
Paper Manufacturers Co.

15 CONSECUTIVE ISSUES
Aeroquip Corp.
Instrument Associates
Jack & Heintz, Inc.
Lavelle Aircraft Corp.

14 CONSECUTIVE ISSUES
The BG Corporation
Greer Hydraulics, Inc.

13 CONSECUTIVE ISSUES
Aero-Coupling Corp.
Electrical Engineering & Mfg. Corp.
Nutt-Shel Co.
Pesco Products Division
Pittsburgh Plate Glass Co.

12 CONSECUTIVE ISSUES
Air-Parts, Inc.
Aircraft Engine & Parts Corp.
Bendix International Division
Durham Aircraft Service, Inc.
Lear, Inc.
Rohr Aircraft Corp.
Titeflex, Inc.

11 CONSECUTIVE ISSUES
Air Associates, Inc.
Air Carrier Engine Service, Inc.
Bendix Products Division
Esso Aviation Products
Teco, Inc.

10 CONSECUTIVE ISSUES
The Aerotherm Corp.
Breeze Corporations, Inc.
Convair
Simmonds Aerocessories, Inc.

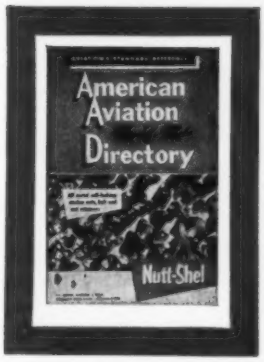
9 CONSECUTIVE ISSUES
Airwork Corp.
American Air Filter Co., Inc.
American Phenolic Corp.
Boots Aircraft Nut Corp.
The New York Air Brake Co.
Scintilla Division
F. W. Stewart Mfg. Corp.
The Weatherhead Co.

7 CONSECUTIVE ISSUES
Ace Products Co.
AiResearch Mfg. Co.
Aircraft Radio-Marine Export, Inc.
Thomas A. Edison, Inc.
Foote Bros. Gear & Machine Corp.
Kollsman Instrument Corp.
Minneapolis-Honeywell Regulator Co.
Steel Products Engineering Co.

6 CONSECUTIVE ISSUES
Aerodex, Inc.
Hartman Electrical Mfg. Co.
L. B. Smith Aircraft Corp.
Twin Coach Co.

5 CONSECUTIVE ISSUES
Bendix Lead Bank Division
Cee Bee Chemical Co., Inc.
Fairchild Engine Division
Guardian Electric
Scott Aviation Corp.
A. E. Ullmann & Associates, Ltd.
Vickers, Inc.
Weber Aircraft Corp.

WILL YOUR COMPANY BE IN AVIATION NEXT YEAR?



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Airline Commentary

By Eric Bramley

Here's a run-down on current policies regarding serving of free drinks on transcontinental flights: American, formerly serving only on non-stops, now furnishes drinks on all luncheon and dinner flights of four hours non-stop or over. After you've had two drinks, AA doesn't urge you to have another. United is serving on three DC-7 non-stops and three that make a stop. You're limited to one 4-ounce refreshment. TWA serves only on non-stop transcontinentals; there's no limit. All follow a practice of offering the drinks before meals, believing that this cuts down on excessive consumption.

• •

Seems that there's a considerable difference of opinion over the effect of dropping the reconfirmation rule. Three of the larger airlines tell us that they've experienced substantial increases in no-shows now that the rule is no longer mandatory. On the other hand, American Airlines, major proponent of abolishing reconfirmation, has noticed little increase. Anyway, it's water over the dam now, and the carriers would do well to concentrate on finding an acceptable penalty system for no-shows. An Air Traffic Conference committee has drafted a proposed system which will be considered at an industry meeting in Chicago on Aug. 11. Let's hope it's a workable plan.

• •

On the subject of no-shows, it's interesting to note that people will go to the trouble of making all the arrangements for a transatlantic flight and then fail to show up. Of course, some of this is due to duplicate reservations; nevertheless some passengers just don't make their flights. It's equally interesting that Atlantic air travel has become so casual that people also go-show and leave on a moment's notice. One airline told us that on a recent day it had 12 no-shows on five flights and filled four of the seats with go-shows.

• •

Odds and ends: Capital Airlines will schedule its Viscounts (starting July 26) on Washington-Chicago route for same time as DC-7: 2 hrs. 20 min. westbound, 2:10 east . . . Note to management of New York's East Side Airlines Terminal: turn up the volume on your public address system . . . Special mention to Capt. W. T. Malone, Eastern Air Lines, for a bang-up job on the PA system. Also invited passengers to visit the cockpit. . . .

AA Passengers Can Put Luggage Under Seats

American Airlines is now permitting passengers on DC-6s and DC-7s to carry luggage with them into the cabin, provided it will fit under the seat.

C. R. Speers, AA's senior vice president-sales, said the innovation "is a major convenience for the traveler during the flight and saves time for the passenger on arrival at destination."

AA has also started a widespread promotional campaign aimed at enlisting the help of 700 luggage manufacturers and 850 retail luggage outlets to publicize the "carry-on" idea.

A "carry-on luggage tester," now installed at each AA airport and ticket baggage counter, measures the size of a bag to see that it is within the limit for underseat stowing—21 by 13 by 8 inches. AA states that luggage packing tests have shown that a bag of this size generally is "large enough to accommodate enough clothing for a week's trip—including a man's suit or two or three dresses."

If the bag fits the tester, a "carry-on approved seal," about the size of a quarter, is affixed so that the bag does not have to be measured again on future flights.

AA has offered to furnish manufacturers, at cost, colorful cards explaining advantages of carry-on luggage, for attachment to every piece of luggage they sell that is within proper dimensions. Also available at cost is an envelope stuffer describing the luggage (the back is blank for manufacturer's imprint). At no cost, AA will furnish a three-dimensional display of a stewardess demonstrating how baggage is stowed.

To retailers, AA is offering a three-dimensional window display plus display cards, luggage tags, stuffers, etc.

Sales, Traffic, Promotion

United Air Lines' "commando" teams, organized a year ago to speed transfer of baggage from plane to claiming area, are chalking up some remarkable records. Chicago's commandos, for example, recently averaged two minutes, three seconds per baggage delivery during an entire shift . . .

One of the trickiest tour folders put out in some time is being distributed by **Scandinavian Airlines System.** Unusual folding makes possible inclusion of complete information on a round-the-world trip (56 days, $3,154 tourist class) and a European tour (42 days, $2,320). Same folder can be used in a folder rack to advertise both services—one side of cover features round-the-world, the other European . . .

Still another promotional scoop for **TWA:** the company will be featured in two films, now in production, on Walt Disney's new television series that starts Oct. 3. Among films to be featured in the "When I Grow Up" portion of the show will be "I want to be a TWA pilot when I grow up" and "I want to be a TWA hostess when I grow up" . . .

Triple tail fins on TWA's Super-G Constellations are being decorated with a big, scarlet, Scotchlite "Super-G." It's below the horizontal stabilizer on outboard fins and above the stabilizer on the center fin . . .

American Airlines plans to install a Reservisor in Chicago after it moves into new space in the Prudential Building, now under construction. Central regional sales headquarters and Chicago district sales and reservations offices will make the move next Feb. 1 . . . Principal city ticket office will remain at 55 E. Monroe St. AA's seventh ticketing facility in the Chicago area will be opened in the lobby of the new building . . .

Piedmont Airlines has an unusual booklet, "How I Became a Lady," describing how its DC-3's were converted from military to commercial service. Excellent job of giving the old workhorse a little glamor . . . **Ozark Airlines** says it's just completed the largest single industrial air charter operation of the year by flying 593 farmers and implement dealers from cities in Illinois and Missouri to Louisville (location of world's largest tractor plant)and return. The 23 charter flights were arranged by International Harvester Co . . .

ADVERTISERS' INDEX

U. S. Local Service Airline Revenues, Expenses, Quarter Ending March 31, 1955

(Compiled by American Aviation Publications from Official CAB Data)

Airlines	Total Operating Revenues	* Passenger Revenues	Mail Revenues	Express Revenues	Freight Revenues	Federal Subsidy	Non-Scheduled Transport Rev.	Total Operating Expenses	Aircraft Operating Expenses	Ground & Indirect Expenses	Net Operating Income Before Income Taxes
Allegheny	$ 1,080,997	$ 584,871	$ -23,654	$ 20,099	$	$ 429,924	$ 9,257	$ 1,151,055	$ 491,670	$ 659,385	$ -70,058
Bonanza	504,064	309,981	11,544	3,555	5,410	166,225	3,500	470,926	196,638	274,288	33,138
Braniff*	258,028	158,479	3,555	3,573	2,103	89,702	....	278,925	113,164	165,761	-20,897
Central	703,801	202,761	27,596	2,975	6,374	459,222	....	757,670	339,782	417,888	-53,869
Frontier	1,347,031	547,740	30,662	6,858	40,961	693,171	17,061	1,303,099	556,456	746,643	43,932
Lake Central	564,455	163,759	14,348	12,478	....	364,406	3,750	554,907	227,390	327,517	9,548
Mohawk	854,884	588,467	6,755	5,732	9,692	220,063	17,325	856,965	384,370	472,595	-2,081
North Central	1,377,599	805,556	46,695	18,798	....	479,292	18,659	1,354,859	678,676	676,183	22,740
Ozark	895,534	396,487	20,361	14,343	....	435,695	23,850	912,762	451,939	460,823	-17,228
Piedmont	1,418,490	815,856	15,570	10,326	13,833	527,769	17,117	1,499,067	751,667	747,400	-80,577
Pioneer	1,115,820	707,714	23,529	4,500	19,800	340,971	10,998	1,072,797	569,551	503,246	43,023
Southern	837,375	355,074	28,042	11,476	....	429,672	6,112	801,571	342,520	459,051	35,804
Southwest	879,753	546,767	16,047	7,734	13,447	280,281	48,570	878,698	428,936	449,762	1,055
Trans-Texas	1,155,203	465,603	39,421	7,631	14,544	615,169	4,891	1,091,185	484,560	606,625	64,018
West Coast	785,487	383,322	10,879	3,353	6,693	372,974	5,683	850,521	387,395	463,126	-65,034
TOTALS	13,778,521	7,032,437	318,638	133,431	132,857	5,864,536	187,073	13,835,007	6,404,714	7,430,293	-56,486
					Helicopter Mail Services						
Hel. Air. Serv.	125,051	....	17,197	....	....	101,534	....	123,113	63,672	59,441	1,938
Los Angeles	262,456	2,375	37,730	13,098	....	207,698	289	210,805	134,238	76,567	51,651
N. Y. Airways	397,115	22,742	12,477	4,499	4,877	351,801	....	365,493	187,545	177,948	31,622

* Figures cover operations of local service route 106 operated by Braniff Airways as result of Braniff-MCA merger.

TWA Asks Manila Route Extension

Trans World Airlines has asked CAB for route extension from Bombay and Colombo to Manila via Bangkok, thus renewing its bid for a round-the-world connection with Northwest Airlines.

Originally, the two carriers' routes were designed for such a connection at Shanghai, but the service never materialized due to Communist activity in China. In an alternate bid, TWA recently was turned down by CAB and the President on a requested extension to Tokyo, but found the board split 2-2 on reconsideration of various route adjustments in the area.

Boeing 707 Enters New Test Phase

After almost 200 flying hours, the Boeing 707 prototype jet tanker-transport is now being readied for its next flight test phase. The new stage will involve various systems tests, aerial refueling experiments and evaluation of some new engine developments.

CAB NEWS

Calendar

July 26—Hearing, Eastern-Colonial Merger Case. Wash., D. C.

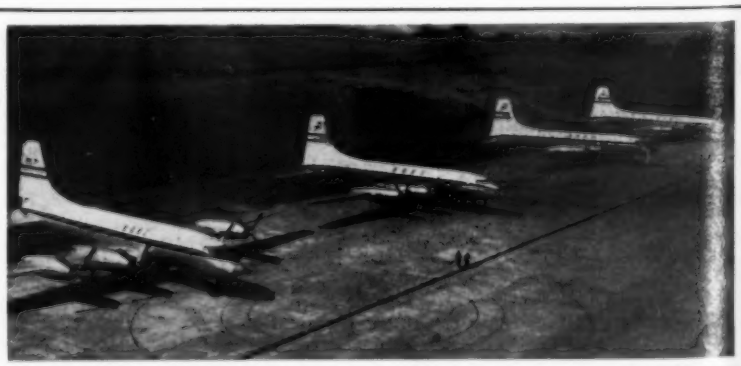
July 27—Hearing, San Jose—San Juan via Panama City (Lineas Aereas Costarricenses), Wash., D. C. Docket 7124.

Aug. 3—Hearing, Resort Renewal Case. Tentative. Docket 6545.

New Applications

Pan American World Airways has asked CAB to order Aerovias Interamericanas de Panama and Trans Caribbean Airways to cease and desist from operating under the name "Aerovias Panama Airways" and from using the abbreviation APA. It contends latter is easily confused with PAA.

Western Air Lines has petitioned for leave to intervene in Pan American World Airways Polar Route application.



THIRD PRODUCTION BRITANNIA made its maiden flight late last month to become the fourth of the four-turboprop transports engaged in extensive flight test programs. The four airliners, all assigned to British Overseas Airways Corp., are shown on the ramp at Bristol Aeroplane Co. Ltd. Approximately 1,800 hours of flight tests have been completed.

the bulletin board

Undisplayed Advertising: $1.00 per line, minimum charge $4.00. Cash with order. Estimate 30 capital letters and spaces per line; 40 small lower-case letters and spaces per line. Add two lines if Box Number is included in lieu of advertiser's name and address.

Displayed Advertising: $15.00 per column inch. Space units up to full pages accepted in this section for classified-type advertising.

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Germans Must Make Up for Lost Time

Talk to any man who was in European civil aviation before World War II and he will speak in awe of the exploits and achievements of Deutsche Lufthansa, the German airline. More likely than not, he will concede that the Germans had the finest airline in Europe.

The war brought a stop to all but a skeletonized operation 15 years ago. When the long, costly and fruitless war came to a close in 1945, there was nothing remaining of the once great Deutsche Lufthansa.

Now in 1955 the German airline is back in operation. I had the pleasure of being on the first eastbound transatlantic press flight June 2 and on the first revenue westbound flight a week later.

Lufthansa's equipment is no longer German-made tri-motored Junkers Ju52's or four-motored Focke-Wulf Condors or four-motored Junkers 90's. Today the fleet consists of U. S.-built Lockheed Super-G Constellations for the Atlantic and Convair 340's for the European network. The former are captained by TWA veterans and the latter by British European Airways veterans, all with German assistants in training.

15 Years Lost

There's been an awful lot of aviation progress since the Germans left off 15 years ago. After making a round-trip flight with Lufthansa, I suspect the gap is wider than they may yet realize. No one in aviation doubts for a moment that the Germans will again operate one of the world's great airlines, but I submit humbly that they will require more time than they, or most observers, had believed necessary to make up for the 15-year interlude.

It is doubtless quite impolite for a free-loader like myself on a press flight to be critical, but I do so in friendly manner and beg forgiveness. But I must confess that it took this recent Lufthansa flight to make me appreciate for the first time what the Cliff (TWA) Mutchlers and the Don (United) Magarrells have achieved in the way of smooth airline passenger service. I guess I've taken all of the precision in-flight service for granted and I, like most regular travelers, gripe at the slightest miscue.

I pledge myself to be more tolerant from here on, because I experienced a flight on an airline just now starting out to fill in the 15-year gap all at once and I saw how the best laid plans can fall apart. The Germans not only have a lot to learn, but, I fear, at least for once, they'll have to discover that everybody else hasn't been doing everything wrong.

Don't misunderstand me. It was a pleasant trip, both ways. Maybe I expected too much. Maybe I had become too convinced that the Germans are organizers **par excellence**. But I think the Germans will have to find out in their own way, through trial and error, that they will have to follow the pattern of passenger service established by the pioneering transatlantic airlines and not try to establish something completely new—and unworkable. I hope in saying this that I have given ample allowance, as one always must do, for inaugural flights because hardly any of these in all history have ever gone off 100% right.

Continental But Slow

Lufthansa has installed a ton of galley equipment on board each Super-G Connie. Frozen dinners are served, and each cup of coffee is made to order. The idea is to serve truly Continental style meals, course by course, something that would out-do all other airlines. In theory this is wonderful. Everybody likes luxury service. But in practice aboard today's airplanes, the net result is an extremely lengthy and halting food service eastbound and a loss of sleep during those precious few hours of darkness. The system works on steamships and restaurants, but the regular ocean-hopper who has appointments and schedules waiting him on the other side of the Pond will blow a fuse at such time-consuming service while trapped in his seat by a tray.

Anybody who flies the Atlantic very much wants to get some sleep on the way and not arrive on the other side looking like a dead goat and feeling like Blunderbore, the stupid giant of English folklore. Our Lufthansa flight departed from Idlewild about 7:30 p.m., which is too late for transatlantic departures in my books anyway (except for all-sleepers) and it was 10:30 when I got my main dinner course and I skipped the last one in order to get three hours' sleep before coming down at Shannon for breakfast. It's amazing how few hours of darkness there are going east in June with that five-hour time differential.

Quite a place, Shannon. Some one of these days somebody is going to open a window to air out the terminal and the whole blooming place will go up in one great mass of internal combustion. But despite the humid atmosphere, which one doesn't notice after being inside for an hour, due, no doubt, to the fact that you, yourself, don't smell like lilac water after sleeping in your clothes all night, I've always liked the Shannon stop. Such good liquor and perfume bargains, and the meals are so typically earthy Irish. And of course if you feel the need of an eye-lifting jolt, just ask for Irish coffee (Irish whiskey in hot coffee topped with whipped cream) and get a boost into the outer world. Temporarily, anyway.

Well, to sum up, Lufthansa is destined to be a success even if its start is somewhat rough. From what I gathered, the Germans will be lucky, however, to be sufficiently trained to operate either Super-G's or Convairs with their own crews even after a year. One difficulty seems to stem from the fact that the Germans dislike taking anybody else's advice. Technically, they'll end up knowing more about the Turbo Compound engines and the Super-G than anyone else, given time.

It was mid-afternoon when we landed at Frankfurt where there was a reception ceremony complete with steins of beer. I spotted Bill Love and Chambers, both of TWA, in the crowd so I hied myself off with them to the TWA VIP lounge for something more refreshing than beer, which I've never learned to like. Also in the group was BEA's station agent, Mr. Manser, and Kim Urbye, the Scandinavian Airlines System manager for Germany, whom I've known of old.

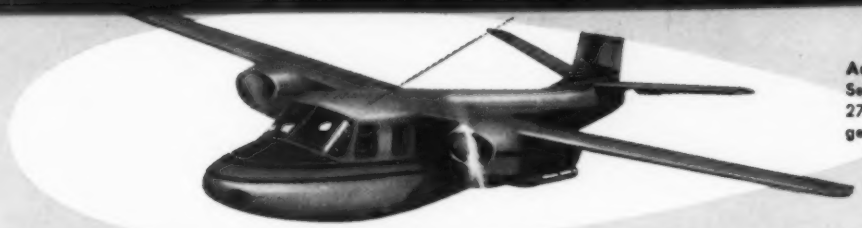
Press Party Split

The Lufthansa press party was split, half staying in Frankfurt and half going on to Hamburg. I was in the Frankfurt group and stayed at a bright, new hotel called the Savigny which has much to recommend it except for so many rooms without baths. I and a few others were unlucky in the bath category.

The first evening in Frankfurt was a long one, starting with a Lufthansa cocktail party at the once-renowned Press Center, and then I went on to Bill Chambers' house where a whole group of visiting TWA firemen headed by Ray Dunn, director of engineering and maintenance from the Kansas City base, were all having dinner. From there I went to see Kim Urbye's new house, the latest in German architecture and furnishings, and found it to be a bright, airy and modern home of advanced design.

Bill Love, who is TWA's dsm, turned out to be a gentleman, scholar, and patriot. He turned over to me for my use while in Frankfurt a Mercedes Benz 300 with chauffeur and I can assure you that a Mercedes 300 is not exactly a Model T Ford. It's a first class vehicle in every respect, although until my dying day I wouldn't admit that it touches a candle to my Bentley. I was really livin' it up while in Frankfurt driving around in such style, but no poor folks in history every enjoyed those moments of luxury which occasionally come my way so much as yours truly.

Circle No. 45 on Reader Service Card. →



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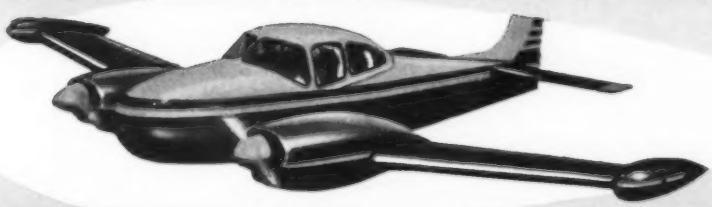
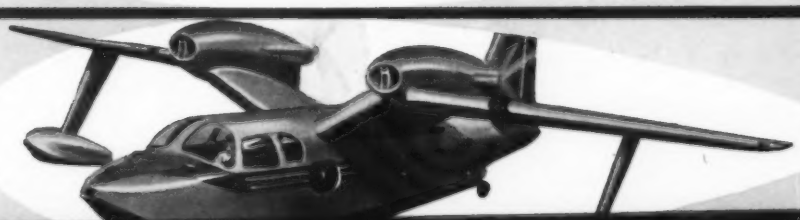


Riley 55. Seats 4. Powered by two 170-h.p. air-cooled Lycoming engines.



Royal Gull.
Seats 5. Powered by two 270-h.p. air-cooled Lycoming engines.

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PRESENTS

MILESTONES IN AVIATION

The ancestor of the guided missile was the aerial torpedo developed by the U. S. Navy and Sperry in 1916-1918.

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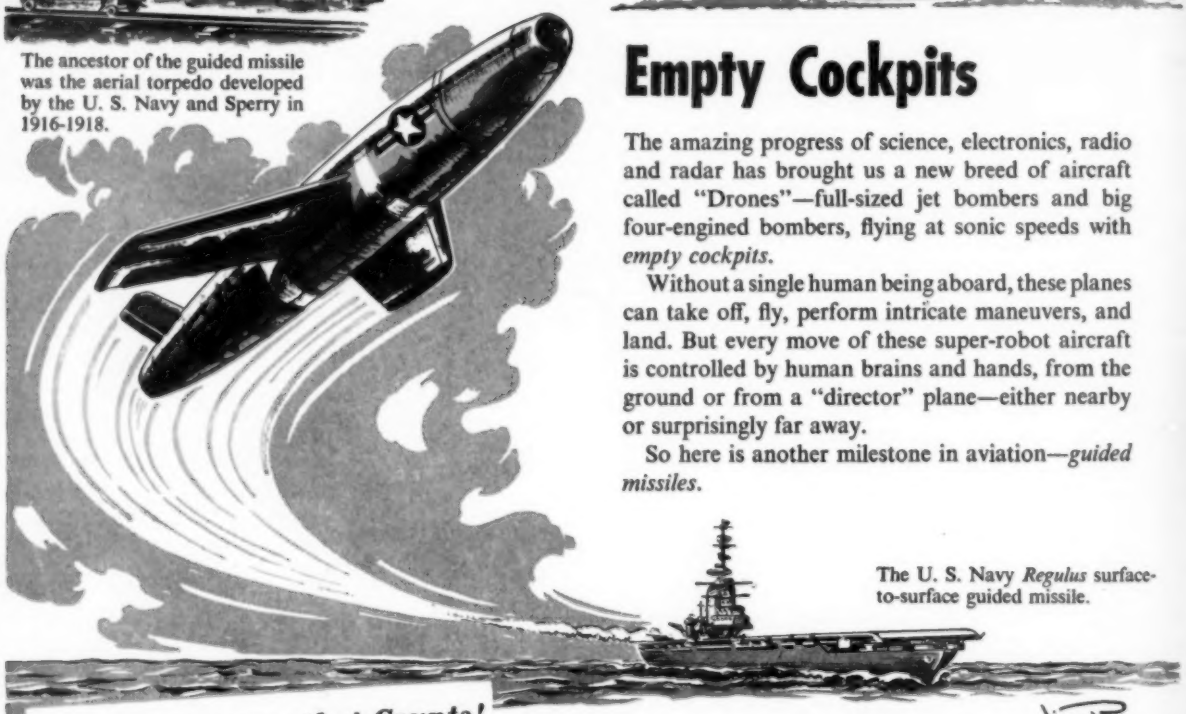
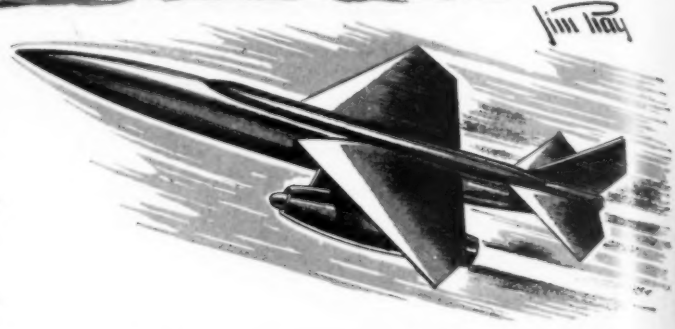
The amazing progress of science, electronics, radio and radar has brought us a new breed of aircraft called "Drones"—full-sized jet bombers and big four-engined bombers, flying at sonic speeds with *empty cockpits.*

Without a single human being aboard, these planes can take off, fly, perform intricate maneuvers, and land. But every move of these super-robot aircraft is controlled by human brains and hands, from the ground or from a "director" plane—either nearby or surprisingly far away.

So here is another milestone in aviation—*guided missiles.*



The U. S. Navy *Regulus* surface-to-surface guided missile.



The *Bomarc IM-99* long range pilotless interceptor missile.

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